

Curbing IT Power Usage

New Ideas To Save Energy In Your Data Center

by David Geer
• • •

THANKS TO ENERGY HOGS such as blade centers, data center energy costs are high. SMEs will find it hard to absorb these kinds of financial hits without some help. Fortunately, there are more than a few ways to curb power consumption.

Measure Power Consumption

According to Chris Loeffler, product manager of the data center solutions group at Eaton (www.eaton.com), one of the biggest trends in data center energy savings is toward looking at how to monitor or meter data center power consumption (through power consumption metrics).

Data centers should start by measuring their power consumption across all of IT. “SMEs can’t

afford to do much submetering. But, they can afford a power consumption monitor that they can plug selected equipment in to see how much electricity is being consumed by a range of representative equipment,” says Simon Mingay, research vice president at Gartner.

For SMEs that can’t afford the power monitor setup, equipment vendors (server and air-conditioning unit companies) have power consumption numbers available. These often come from the vendor’s customers. This information can be used to model power consumption of the IT infrastructure (using simple spreadsheets), according to Mingay.

More Is Less

SMEs need to distribute higher power voltages out to their equipment, according to Loeffler. That’s because today’s servers run more efficiently at higher voltage.

“Data centers benefit from increased power in the same rack footprint because the higher voltage uses less current per server,” says Loeffler. Therefore, according to Loeffler, an SME can reduce the size of the cabling or put more equipment in the same space and utilize better cooling practices.

In the North American market, an SME should raise the voltage from 120 volts to 208 volts, according to Loeffler. “If we want to put a number behind that efficiency gain using that higher voltage, the efficiency of the power supply at full load would increase two to three percentage points. It may increase even more when using the

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Consider Tiered Storage

This Approach May Streamline How Your SME Stores Data

by Don Reisinger
• • •

COMPANIES TODAY ARE GROWING at exponential rates, and data bills are rising with their growth. As if that weren’t enough, some of these companies tend to save too little or too much data, which results in data insecurity or unnecessary spending. And inevitably, companies also face the challenge of trying to find the right data at the right time.

In an era where safeguarding data is paramount and not enough companies are

doing what they should to protect themselves from catastrophe, a number of storage techniques have emerged to help organizations find a suitable solution for addressing data concerns. One option small to midsized enterprises may consider is adopting a tiered storage approach.

How Tiered Storage Works

According to the Department of Labor Statistics, 93% of all companies that suffer a significant data loss go out of business

within five years. The study points out that when data is lost, the ability for the average company to recover is almost impossible given the extremely important nature of the documentation.

To minimize that threat, a tiered storage approach may be a way for companies to safeguard themselves. At its simplest level, a tiered storage approach involves at least two forms of storage: Critical and frequently accessed data is migrated to the top tier, while older or noncritical data is migrated to a lower tier. The top tier is stored in more expensive, higher quality storage, while the lower tier is migrated to lower-cost storage. Simply put, a tiered storage approach revolves around getting the right people to the right level of data when needed without sacrificing performance or cost.

Although this may sound appealing, a common question many industry experts ask is whether such an approach is actually needed.

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Data Center Energy Efficiency

While “green” is quickly gaining ground as one of the most overused words in IT, there are definite reasons to pay attention. We offer expert tips to curb your power usage, buy “green,” and more.

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At its simplest level, a tiered storage approach involves at least two forms of storage media, with critical data and regulated data at the top-most tier, followed by frequently accessed data at the general level.

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Product Releases | 14

■ **Acronis** announced Acronis Recovery for MS SQL Server, a backup software system designed for large SQL databases. ■ **ATEN** announced its new 8- and 16-port IP KVM switches with built-in IP remote access. ■ **Belkin** announced the new SOHO KVM switch family, which connects multiple computers to a single keyboard/mouse/monitor set. ■ **BenQ** released the SP870 digital projector, which provides high brightness via a 5000 ANSI lumen lamp. ■ **DataCore Software** unveiled a new, portable VM Starter SAN. ■ **Q1 Labs** released a new platform for monitoring network behavior and security management: QRadar 6.1. ■ **Tidal Software** announced Tidal Enterprise Scheduler 5.3.1, which supports applications and systems from Microsoft, Oracle, and others.

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Simply put, a tiered storage approach revolves around getting the right people to the right level of data when needed.

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PROCESSOR

CPS Automatic Power Cycle Keeps Equipment Online

New Device Automatically Power Cycles Frozen Devices



WHEN IT COMES TO appliances that control network traffic, ordinary monitoring tools aren't enough. Sure, the monitoring system alerts you to traffic disruptions, but the entire network remains down until you're able to reach the frozen router or modem and restart the power cycle. To speed up the process, CPS (Computer Peripheral Systems) offers the APC (Automatic Power Cycle) SWTAPC-AC appliance, which monitors network status and automatically restarts power to a frozen device, making the hung router a minor annoyance instead of a major downtime problem.

CPS built the APC unit with DHCP routers and modems in mind, but customers can use the device to cycle power for any critical appliance. The APC unit sits between the AC outlet and the selected devices (it is preconfigured to handle up to two devices), such as a router and modem. It regularly pings two IP addresses to confirm that the network's Internet connection is functioning. When the APC unit determines that a device has frozen (due to ping failure for both IP addresses), it automatically recycles power to its AC OUT outlet for five seconds.

Customers can configure multiple APC unit features by connecting the device to a PC (via a RS-232 serial adapter). The PC

must run a terminal emulation program, such as Hyper Terminal or ProComm. Once you connect to the unit you can change the primary and secondary ping addresses, enable or disable ping-out capabilities, change the ping interval from its 5-minute default setting, or extend the power-off countdown from the default five seconds up to 90 seconds.

The APC unit also supports manual triggers with its Ring Reboot feature. Customers can ring the APC device over a DSL or phone line to initiate a power reset. The APC device resets after six rings by default, but customers can change the ring number via the unit's serial connection.

The APC appliance is small and light. It has two AC receptacles (one IN, one OUT), one RJ-45 port, and three RJ-11 ports. The device also sports a Power/Reset button and a rocker for the 15-Amp circuit breaker, as well as status LEDs. The device supports 110VAC to 240VAC power inputs.

CPS Automatic Power Cycle

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 Computer Peripheral Systems, Inc.

Enhance Technology Adds To Its UltraStor RS Line

RS16 IP-4 Handles High-Impact, High-Volume Tasks



ENHANCE TECHNOLOGY'S RS16 IP-4, the newest member of the company's UltraStor RS Series of storage products, gives IT departments a host-independent, transparent, and driverless method for adding RAID (0, 1, 3, 5, 6)-protected storage to existing infrastructures, regardless of the operating system or hardware already in place.

Supporting Microsoft VSS (Volume Shadow Copy Service) and coming in a 3U, 16-disk modular rack design, the RS16 IP-4 offers such features as a built-in 64-bit RAID controller, up to 2GB of cache and 3Gbps SATA disks. Advanced features available via the RS232 interface include multiple array settings; such iSCSI parameters as connection mode, ID, and LUN mapping; and SNMP and security options.

Constructed to handle high-volume and high-impact network storage tasks, including those related to video broadcasting and backup and recovery applications, the UltraStor RS16 IP-4 also includes an ability to let administrators configure the appliance in just minutes. Additionally, auto-configuration abilities are available via a rear-located LCD control panel, and remote Web browser-based management and monitoring are also possible. An included menu screen allows access to set

up the RS16 IP-4's configurations, as well as change settings as storage needs change over time. Physical protection comes in the way of two included redundant, hot-swappable power supplies and two fans to guard against hardware-failure interruptions.

Beyond the inclusion of quad GbE (iSCSI) ports, the RS16 IP-4 also includes N-Way Mirror and enterprise-class Snapshot for point-in-time recovery protection against accidental deletion of data. Additionally, the appliance is suitable for Microsoft Exchange and SQL Server environments, as well as disk-to-disk backup, database pools, image acquisition, near-line storage, data centers, media and asset libraries, and shared SAN networks. Further, dynamic online RAID expansion is possible without total system downtime being required.

Enhance Technology UltraStor RS16 IP-4

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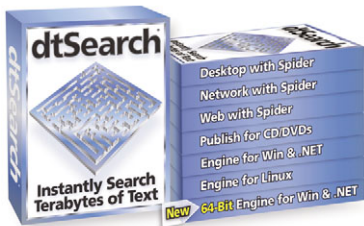
dtSearch Can Scan Terabytes Of Data In A Variety Of Formats

TODAY'S ENTERPRISES are filled with vast amounts of data in a variety of formats in seemingly endless numbers of locations. Finding the information you need can be daunting, which is where programs such as those from dtSearch can be essential.

dtSearch can instantly search terabytes of text because it builds a search index that stores the location of words in documents. Indexing is easy: Simply select folders or entire drives to index and dtSearch does the rest. dtSearch automatically recognizes and supports all popular file formats and never alters original files.

dtSearch can also create (and search with a single request) an unlimited number of indexes. Since you may want to search files that dtSearch has not indexed, dtSearch also does unindexed, as well as "combination," searching.

All dtSearch products can index more than a terabyte of text in a single index and create and search an unlimited number of indexes. Search time is typically less than a second, even across terabytes of data.



Along with the terabyte indexer, all dtSearch products include more than two dozen indexed, unindexed, full-text, and fielded data search options; support for hundreds of international languages; display of Web-ready content with highlighted hits and all images, links, and formatting intact; built-in HTML converters for hit-highlighted display of other popular file types; and distributed or federated search options, with

display of local and remote content. The dtSearch product line also embeds the dtSearch Spider, providing support for public sites, secure content HTTPS, password-accessible sites, and forms-based authentication; searching of static and

dynamic content; and relevancy-ranking of spidered and non-spidered content.

The dtSearch Engine lets C++, Java and .NET developers add dtSearch terabyte indexer and file format support to Web-based and other applications.

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A Master Enterprise View

New ATEN KVM Bundle Provides Perfect Features For Monitoring & Maintaining Servers & PCs

TODAY'S DATA CENTERS require convenient, space-saving, streamlined KVM equipment. ATEN's 17" Single-Rail LCD Integrated Console and MasterView KVM bundle is designed with those needs in mind.

ATEN's economy LCD KVM console, CL1000M, integrates a keyboard, 17-inch LCD, and touchpad in a 1U Slideaway housing. Setup is fast and easy. There is no software to configure, no installation routines, and no incompatibility problems. Slide the console module section out and flip up the cover, and you are ready to work.

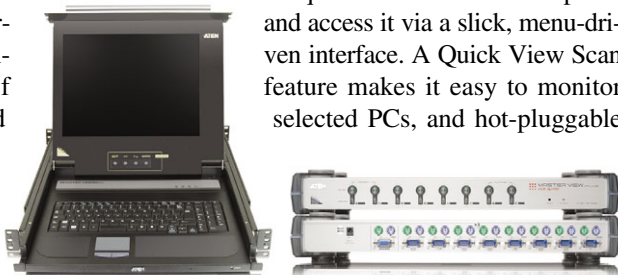
When finished, flip down the cover and slide the console module back into the rack.

By using the CL1000M to manage your installation, you save space; eliminate the expense of having to purchase a separate keyboard, monitor, and mouse for each PC if attaching to a KVM switch; and can take advantage of upgrading your current system

ATEN is now bundling the CL1000M with an eight-port MasterView Plus,

which helps reduce the need for redundant hardware. With the MasterView Plus, you can control up to 512 computers with a single keyboard, monitor, and mouse. And it requires no software.

MasterView Plus is more than a simple eight-port KVM switch. A built-in Auto-Scan mode lets you monitor every attached computer for a specified amount of time, while the on-screen display lets you assign a unique name to each computer and access it via a slick, menu-driven interface. A Quick View Scan feature makes it easy to monitor selected PCs, and hot-pluggable



capabilities mean you can add or remove PCs for maintenance without powering down the switch. The MasterView's 1U, 19-inch rack-mountable casing and status-monitoring LEDs make it ideal for server rooms or other multicomputer environments.

ATEN 17" LCD Integrated Console & MasterView KVM (model CLCS9138MKIT)

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NEWS



Microsoft Bids For Enterprise Search Company

MICROSOFT ANNOUNCED its intent to purchase Fast Search & Transfer, a Norwegian provider of enterprise search products, for about \$1.2 billion. Jeff Raikes, president of the Microsoft Business Division, says the move is essential as enterprise search becomes more indispensable. “Until now organizations have been forced to choose between powerful, high-end search technologies or more mainstream infrastructure solutions,” he says. The deal will also expand Microsoft’s European research and development efforts. Fast Search’s board of directors has recommended its shareholders accept the offer. The deal is expected to close in the second quarter, pending regulatory and shareholder approval.

New Green Mandates Issued For Federal Agencies

AN INTERIM RULE HAS BEEN DETAILED by the U.S. Department of Defense, NASA, and the General Services Administration regarding the purchase of equipment in federal agencies. Comments on the proposal are being accepted through Feb. 25. The rule formalizes the government’s use of EPEAT (the Electronic Product Environmental Assessment Tool) to require agencies to buy energy-efficient computers and monitors that contain reduced levels of toxic chemicals. EPEAT rates qualifying desktops, notebooks, and monitors as gold, silver, or bronze, based on 51 environmental criteria. Criteria include the absence of paint and coatings that aren’t compatible with recycling and the unit’s ease of disassembly.

IBM Faces Pollution Lawsuit

ONE BUSINESS, ONE CHURCH, and more than 90 current and former residents of Endicott, N.Y., have filed a lawsuit against IBM claiming that its manufacturing facilities in the town polluted the environment and have made many residents sick. The plant was open from 1924 until 2002, and the plaintiffs say in that time period IBM released “millions of gallons” of toxic chemicals into the air, soil, and groundwater as it manufactured computers, circuit boards, and other products. The plaintiffs say a number of their health problems stem from exposure to the environmental contamination. IBM says the lawsuit lacks merit.

Microsoft To Offer Volume Licensing For SMEs

IN MARCH, MICROSOFT HAS PLANS to launch the Open Value Subscription Program, its new volume licensing model. The new program will allow partners and U.S. and Canadian customers to subscribe to Microsoft software needed for their businesses, making software licensing more affordable to SMEs. Although the program is not a lease, it offers many of the same benefits as a lease would, including the ability to pay for the use of software for a specific period of time while maintaining a company’s option to make changes to software usage based on growth and need.

Intel Responds To EC Allegations

AT AMD’S REQUEST, the European Commission investigated Intel’s business practices, and in July it claimed that Intel had shown an “abuse of a dominant market position” by offering significant rebates for companies to use only its chips, selling server processors below cost to gain a competitive edge, and allegedly making payments to delay AMD-based PC launches in Europe. Now Intel has formally responded to the EC’s “statement of objections” and has also requested an oral hearing. The response and hearing are confidential. After the oral hearing, the Commission can remove its objections against Intel, impose fines and sanctions against it, or ask for more information.

One Laptop Per Child Faces Lawsuit . . .

THE OLPC (ONE LAPTOP PER CHILD) project is on the receiving end of a patent infringement lawsuit. The lawsuit, filed by Lagos Analysis, or Lancor, claims the keyboard used in the OLPC XO laptop infringes on a patent Lancor owns in Nigeria for a keyboard with four Shift keys to make it easier to type in multiple languages. Lancor has a temporary injunction preventing OLPC from selling its devices in Nigeria and is asking for \$20 million to settle the suit. The Nigerian government had placed an order for 1 million of the XO laptops.

. . . & Intel Quits OLPC Board

INTEL HAS QUIT THE OLPC (One Laptop Per Child) board of directors. The departure came just six months after Intel joined the board and agreed to work with OLPC on a version of the XO laptop that would use an Intel processor. Intel’s decision to quit the board came after it says it was asked by OLPC founder Nicholas Negroponte to stop selling chips to potential OLPC competitors and stop working on the Intel Classmate PC, which is designed for students in developing markets worldwide and could potentially

compete with the XO laptop. In a statement, Negroponte said, “While we were hopeful for a positive, collaborative relationship, it never materialized.”

Technology Sales To China In Question

THE BUSH ADMINISTRATION is facing questions after easing some export restrictions to China on certain technologies. Some new equipment has been authorized to be exported to Chinese companies that have been approved by Washington as trustworthy. The changes were made in order to help boost sales of high-tech equipment despite strict regulations on technology that could potentially have military applications. However, weapons experts are wary that some of the technology may end up assisting China modernize its military. In addition, there are concerns that China could turn around and share technology with Iran or Syria.

Aruba Buys AirWave

ARUBA NETWORKS plans to purchase AirWave Wireless, which makes products for managing large, multivendor wireless networks. Aruba will pay an estimated \$37 million for the firm; the deal should close in Aruba’s fiscal third quarter. Aruba President and CEO Dominic Orr says the purchase will make Aruba the first mobility vendor to offer cross-vendor network management support, enabling organizations to set up and manage networks using legacy and new devices from multiple vendors. AirWave’s management tools support products from Cisco, Aruba, HP ProCurve, and a number of other leading vendors; Aruba plans to expand that coverage.

IBM Acquires Storage Technology Firm

IBM ANNOUNCED ITS ACQUISITION of storage technology firm XIV, which is based out of Tel Aviv, Israel. Financial details of the deal have not been made public. The company and its employees will become part of the IBM Systems and Technology Group under its IBM System Storage business unit. XIV’s NEXTRA architecture will help IBM address upcoming needs associated with next-generation digital content. According to IBM, among NEXTRA’s features are its ability to scale dynamically, heal itself after a failure, and self-tune to achieve optimum performance.

SCO Delisted With Nasdaq

FOLLOWING A DECLARATION of bankruptcy in September, The SCO Group has been taken off the Nasdaq Stock Market. Upon SCO’s filing for bankruptcy, Nasdaq informed SCO that it would remove it from the stock market, and the appeal SCO filed to stop the delisting was denied. For years, SCO has been involved in a legal tangle with IBM because it said IBM used copyrighted Unix code from SCO to support the Linux OS. However, a federal judge ruled in August that SCO did not own the Unix copyright, a decision that SCO said may have cost the company \$30 million, while it only had \$10.4 million in cash.

AMD To Open New Facility In India

ADVANCED MICRO DEVICES announced plans to open another Research & Development facility in Hyderabad, India, which will be the company’s fourth R&D center in India and its second in Hyderabad. The new facility will measure 30,000 square feet and will house AMD employees involved in research and development for AMD computing solutions and next-generation graphics. The company’s growing R&D team in Hyderabad focuses on embedded system design for consumer electronics and VLSI (very-large-scale integration) technology. The new facility will employ about 200 professionals.

UpcomingIT Events

- JANUARY -

Florida Educational Technology Conference
January 22-25
Orlando, Fla.
www.fetc.org
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WCA International Symposium & Business Expo
January 29-Feb. 1
San Jose, Calif.
www.wcai.com

- FEBRUARY -

SCALE 6x - 2008
Southern California Linux Expo
February 8-10
Los Angeles, Calif.
www.socallinuxexpo.org
.....

Comptel Plus Spring 2008 Convention & Expo
February 24-27
Nashville, Tenn.
www.comptel.org

- MARCH -

Gartner Wireless & Mobile Summit
March 3-5
Chicago, Ill.
www.gartner.com/it/summits/ra11/index.jsp
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Secure IT Conference
March 4-6
San Diego, Calif.
www.secureitconf.com
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Help Desk Institute Conference
March 9-12
Dallas, Texas
www.thinkhdi.com/hdi2008
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VoiceCon
March 17-20
Orlando, Fla.
www.voicecon.com
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Boston SecureWorld Expo
March 26-27
Boston, Mass.
www.secureworldexpo.com
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Data Center World
March 30-April 3
Las Vegas, Nev.
www.afcom.com

- APRIL -

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Gartner Business Intelligence Summit
April 1-3
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www.gartner.com/it/summits/bi6/index.jsp
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RSA Conference
April 7-11
San Francisco, Calif.
www.rsaconference.com
/2008/US/home.aspx

WATCH THE STOCKS

This information provides a quick glimpse of current and historical stock prices and trends for 15 major companies in the technology market.

Company	Symbol	Year Ago	Jan. 2 \$	Jan. 9 \$	% change from previous week
BEA Systems	BEAS	\$12.86	\$15.55	\$14.82	▼ 4.69%
Computer Associates	CA	\$24.86	\$24.55	\$22.61	▼ 7.9%
Cisco Systems	CSCO	\$28.92	\$26.54	\$26.24	▼ 1.13%
Dell	DELL	\$26.62	\$24.39	\$20.93	▼ 14.19%
Electronic Data Systems	EDS	\$26.85	\$19.93	\$18.50	▼ 7.18%
Google	GOOG	\$505	\$685.19	\$653.20	▼ 4.67%
HP	HPQ	\$43.53	\$49.65	\$44.44	▼ 10.49%
IBM	IBM	\$99.34	\$104.69	\$98.31	▼ 6.09%
Intel	INTC	\$22.13	\$25.35	\$22.75	▼ 10.26%
McAfee	MFE	\$29.35	\$35.79	\$32.29	▼ 9.78%
Microsoft	MSFT	\$31.21	\$35.22	\$34.44	▼ 2.21%
Oracle	ORCL	\$17.50	\$22.49	\$21.61	▼ 3.91%
Red Hat Software	RHT	\$22.16	\$20.60	\$19.95	▼ 3.16%
Sun Microsystems	JAVAD	\$6.06	\$17.42	\$15.66	▼ 10.1%
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SIX QUICK TIPS

Do’s & Don’ts When It Comes To Buying Tapes & Replacement Disks

by Drew Robb

STORAGE MEDIA ARE GETTING BIGGER, better, and faster with each passing year. But the sheer volume of data stored on tape and disk means you have to make the right choices when it comes to purchasing them. Here are some important tips concerning the purchasing of storage media.

Buying Tape

With so many tape formats around, the important thing is to purchase a storage platform that you can grow into. In other words, a platform that considers your complete storage requirements today, as well as a few years from now. Some aging formats, for instance, no longer have much vendor support. Even if you cling to older-generation tapes that remain compatible with the newest versions, how long will that remain the case? Vendors cannot be expected to continue support forever.

“You should consider a tape format that allows you to read/write data to older generations within a technology, as well as future generations,” says John Goode, manager

of media product management at Quantum (www.quantum.com).

With tape formats such as LTO and DLT, typically the most recent generation can at least read two older generations of cartridges. For instance, an LTO-4 drive can read/write data onto LTO Ultrium 4 and LTO Ultrium 3 cartridges and read data from an LTO Ultrium 2 cartridge. Pay attention to such details and determine the longevity of tape media before making any decisions.

To Hold On Or Not

If you have older tape hardware, is it best to hang onto it or not? Even though the latest and greatest is better, faster, more compact, and cheaper per gigabyte, there is ample reason to hold on to aging hardware, especially if the older tape drive is used primarily for daily backup and has significant capacity. However, reasons to change include the need for faster backups or more capacity, compatibility with software, and the need to archive for many years. Such enhancements are usually introduced with new-generation media releases.

But there is another aspect to consider. If you need to recover data from very old tapes, for instance, you may not be able to access the data unless you have the hardware on which it was made.

“You need a tape drive that can read your tapes whether it is the original tape drive or a later-generation drive that is compatible,” says Goode. “It is also smart to archive the original software and even the computer, or at least the operating system, in case later versions are not compatible.”

The alternative is to copy old tapes onto new-generation tape drives and tapes to ensure the data is retrievable. But that can be very time-consuming and few companies ever do it. So hang on to the hardware just in case.

Buy Direct

For those who own disk arrays or NAS (Network Attached Storage) servers, there comes a time when disks have to be replaced. In such cases, it is probably not smart to go shopping to Best Buy or Fry’s Electronics to find a replacement. The safest bet is to buy directly from the OEM or from a hard drive manufacturer that provides enterprise drives. Most disk array manufacturers provide capacity upgrades or services for drive replacements.

“Adding drives to an array can be done individually or in RAID groups,” says Philip Fote, storage product marketing manager for EMC (www.emc.com). “It’s important to note that the hard drives for sale at Best Buy are not the same products sold by storage vendors and don’t meet the specifications of storage arrays. Customers are better off buying capacity directly from the storage vendor.”

What about if you have an old disk array? When should you buy newer drives for that array, and when should you just get a newer array? The simple answer is that if you are experiencing rapid data growth, it’s probably time to buy a new array. But if the existing box has plenty of room, continue to buy drives for it as long as you can—providing you can continue to purchase the disks you need and don’t run into any incompatibility issues.

“Adding capacity to an existing storage array is always the least expensive way to add storage,” says Fote. “However, some of the older arrays don’t support the new

BONUS TIPS

Think small. If a very small outfit currently operates with a simple tape drive that is now obsolete, but they have a supply of tapes that can last them several years, should they change?

“Given that they are still completing their back-up on one tape, they are less likely to run into problems until their existing supply of reliable tapes is exhausted,” says Louis Foler, a storage specialist at CDW (www.cdw.com). “But they should obviously upgrade before they run out of reliable tapes.”

Buy in bulk. Tape cartridges, particularly the newer ones, can be quite expensive. It makes sense to buy in bulk as a way to save big. If you only use one or two a year, maybe the economics aren’t there. But if your usage merits it, buy enough tapes to last you a year or so, and you will earn a substantial discount.

technologies and larger capacity drives, which are all designed to increase functionality and lower costs.”

Sizing Correctly

Some companies need huge data repositories, while others are most interested in fast throughput of smaller data sets. It all depends on individual requirements: the amount of time and data needed to properly perform regular data backups, as well as how data is to be stored and accessed and how often.

“Organizations need to size their storage solutions according to the amount of data they have and the time that they have to back up,” says Louis Foler, a storage specialist at CDW (www.cdw.com). “The first step is usually to select tape size appropriate to the expected amount of gigabytes to be backed up. This minimizes the need to change tapes as frequently.”

Organizations should also consider the window of time in which they can back up data. In order to access data, organizations usually need to take applications down when they back up to tape. If an organization runs close to 24/7, then that window is quite small. The length of downtime is directly tied to the speed of the tape device. [E]

BEST RETURN ON INVESTMENT:

Do The Math

○ In the storage automation market, tape technology improves roughly every two years. New drive formats, such as LTO4, provide higher-density cartridges, greater performance, and improved security. When SMEs are deciding whether to move to a newer format, there are many factors to take into account before committing. In some cases, a move to the latest equipment will provide high ROI over a short time period. But in others, the associated costs may not be worth it. In all cases, do the math carefully.

“The acquisition costs associated with new tape drives and cartridges includes network infrastructure upgrades to accommodate the extra throughput and updates to tape rotation procedures when leveraging offsite archives,” says Philip Fote, storage product marketing manager for EMC (www.emc.com). “But many customers can benefit from the performance and density improvements which come with every refresh cycle.”

EASIEST TO IMPLEMENT:

Old With The New

○ With disk arrays, it isn’t necessarily the case that you should throw out all the old ones and replace them with newer models. Although it is not usually possible to go from SCSI drives in an older system to newer SAS or SATA drives in that same system, sometimes it is possible to add a new tray with the newer drives. This doesn’t happen very often, however.

“It is a much better idea to keep the old system as it is and add a new system for the project at hand, then add the two together through virtual storage,” says Louis Foler, a storage specialist at CDW (www.cdw.com). “Virtualization allows organizations to bring together dissimilar storage hardware under one umbrella.”

“You need a tape drive that can read your tapes whether it is the original tape drive or a later-generation drive that is compatible.”

-Quantum’s John Goode

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Going Green: Challenges & Rewards

Environmental Awareness & Efficiency Are All The Rage, But Is “Green” The Right Strategy For Your SME?

by Elizabeth Millard

PRODUCT MANUFACTURERS and major corporations seem to be painting themselves greener every day—announcements about “green” initiatives and designs are increasingly trumpeted, due in large part to increased demand for more efficient data center products and services.

Beyond the hype and hope, though, going green has a number of challenges and rewards that will require each data center to evaluate the strategy for individualized long-term effectiveness, not just short-term advantages.

Thinking Green

As a term, “greening” the data center encompasses more than one strategy. Unlike “green” initiatives in the consumer market that include buying recycled materials and reducing the use of pesticides and chemicals, a green data center is focused primarily on making centers more efficient so they don’t use unnecessarily large amounts of power.

Also part of the green movement is equipment refurbishing, which prolongs the life of technology such as servers and adheres to landfill regulations regarding computer equipment and monitors.

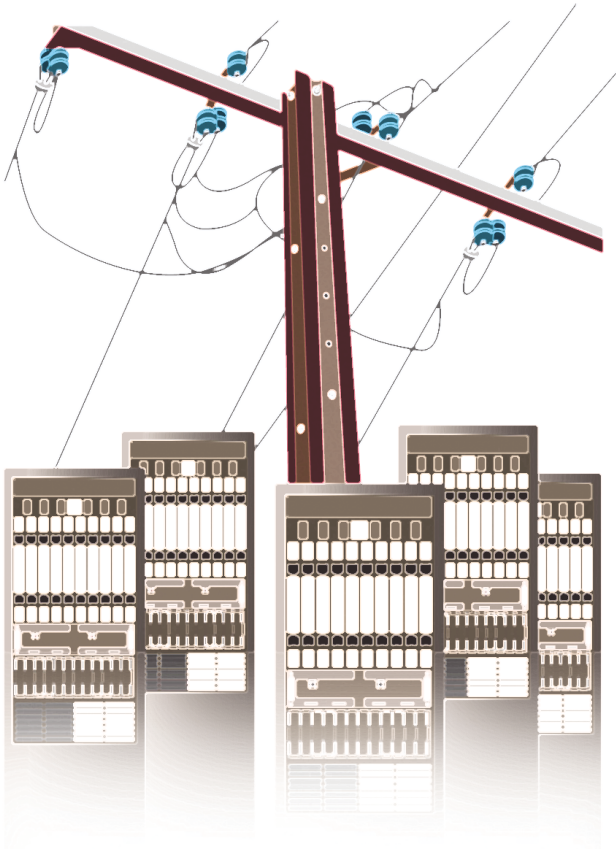
Data centers of every size have been considering implementing at least some green strategies through investing in virtualization, purchasing technology that promises more efficient power flow, or overbuilding centers to allow for better heat dissipation.

Big Benefits

Many experts have touted the rewards that come with a greener data center. On a larger scale, more efficient data centers would be less taxing on city and state power supplies. At a company level, better server strategies, such as virtualization, would result in less space needed and lower operating costs, notes John Baschab, author of “The Executive’s Guide to Information Technology.”

“People are going to get very serious about power savings, ‘green’ initiatives, and server compaction via virtualization, and these are all related,” he says. “You get a double benefit in the data center because every watt of power consumption reduced also reduces cooling needs by a watt.”

Looking ahead, SMEs may find themselves bolstered by regulations designed to address data center power issues. In August of last year, the U.S. Environmental Protection Agency issued a report to Congress that outlined the need for energy-efficient improvements in data centers. The EPA doesn’t believe companies need to wait for more technology to be developed in order to see energy and budget savings now.



“[E]xisting technologies and design strategies have been shown to reduce the energy use of a typical server by 25% or more,” the report notes. “Even with existing IT equipment, implementing best energy-management practices in existing data centers and consolidating applications from many servers to one server could reduce current data center energy usage by around 20%.”

Challenge Round

Like any major strategy, green initiatives also present some challenges in implementation. For SMEs, one consideration could be cost; although tactics might promise savings in the long run, upfront costs might include new construction to build out a data center, hiring an equipment disposal firm, and buying new servers that can handle virtualization.

Another factor may also be training in areas beyond IT management because data center managers are now being asked to understand heating, air conditioning, and ventilation issues. Becoming well-versed in HVAC could be daunting for IT departments that are already overtaxed with daily tasks and upkeep.


With virtualization, some companies may find it challenging to provide sufficient network and storage connectivity, which allows for maximum flexibility on virtual machine deployments, according to Jon Toor, vice president of marketing at Xsigo (www.xsigo.com).

Xsigo recommends several tactics (see the “Leveraging Virtual I/O For Greener Data Centers” sidebar) for eliminating the issues that limit flexibility, Toor notes, including consideration of virtual I/O, which includes putting multiple connections on a single cable. “This ensures security for multiple applications per server without creating cable bloat,” says Toor.

Companies trying to go green could also get mired in trying to define energy efficiency—complex systems that involve multiple systems can make definitions difficult. “Energy efficient” is usually defined based on service output with less energy input, but usage of service might vary during the day or according to which applications are running. Because of this, SMEs may need to create their own standard definitions of productivity rather than relying on manufacturer-produced statements of efficiency.

Internal company organization is yet another challenge that has to be addressed. In the EPA report, the agency cited “split incentives” as a barrier in some companies. “In many data centers, those responsible for purchasing and operating the IT equipment are not the same people that are responsible for the power and cooling infrastructure, who in turn typically pay the utility bills,” the report notes. This situation leads to a split incentive, in which those who are able to control the energy use of the IT equipment don’t have much incentive to change.

Finally, there is risk aversion, the EPA adds. Changes always bring the potential for downtime, particularly if an aggressive new strategy is being implemented. The EPA report notes: “Energy efficiency is perceived as a change that, although attractive in principle, is of uncertain value and therefore may not be worth the risk.”

The agency hopes this perception might change, though, and in the future, the challenges may be minimized by government-sponsored changes such as better product labeling, commercial building technical assistance, and financial incentives for energy companies to help their customers build more efficient data centers. 

Leveraging Virtual I/O For Greener Data Centers

According to Jon Toor of Xsigo (www.xsigo.com), here are some ways to leverage virtualization to achieve green goals:

- Plan for I/O that can provide each virtual machine with secure connections to needed storage and networks.
- Combine virtual I/O and storage virtualization to maximize savings: Newer storage technologies, such as thin provisioning, allow a data center to allocate capacity without actually having spinning disks consuming power. Similarly, I/O virtualization allows for connection of storage to a specific virtual machine. When processing requirements grow, the virtual I/O and the virtual machine can be moved to another server.
- Get high availability on low power by using virtual I/O for full virtual machine portability, where the primary and failover servers have the same network connectivity.

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Tips For Buying Green

Knowing Your Current Usage & Setting Goals Is Critical

by Mark Brownstein

GREEN COMPUTING in the enterprise is a buzzword that gained considerable momentum in 2007 and will probably transition to commitment this year. The concept of green computing covers a lot of different areas but can be summarized in a few simple words: doing what is good for the planet.

Implementing green is often a set of trade-offs. For example, upgrading a computer from an older model to a newer, more efficient model may sound good. However, the energy savings gained from those extra kilowatts used to power the older computer may be offset by the global damage caused during manufacturing the components of the new computer.

According to Matt Heinz, senior director of marketing at Verdiem (www.verdiem.com), when buying green, it's important to look for tried and true products. "First off, look for products that are tested by others," he says. "Look for things that are proven. Check with your peers; go to association meetings, trade shows; look at vendors with reference accounts. If you want something others have used, ask for reference accounts and ask to see tangible measurable results from other people putting it into their business."

Looking Ahead At Power Needs

As enterprises approach the maximum amount of power available from their utilities, they may, in fact, reach a limit to the amount of energy that can be delivered. This maximum will equate to a maximum number of servers and other equipment that can be powered at a facility. Once the limit is reached, adding equipment would require an additional facility in order to get the power necessary for the additional computing equipment. By moving to more efficient power distribution and increasingly efficient hardware, the eventual move to new facilities could potentially be avoided. So, when assessing the ROI for updated power equipment, the cost of building, buying, or renting new facilities may be another item to factor into the equation.

Measure Your Use

Before you make any purchasing decisions, it is important to know what your company's current power usage is. "If somebody comes along and says, 'I'll do something to your data center [that will reduce your power consumption], you should have a meter in the data center so you can do a before and after. Without a meter, there's no way of comparing,'" Eric Birch, executive vice president at Degree Controls (www.degreec.com), says.

Green power vendors may assist in such a survey and provide a set of options for reaching your energy goals. You should get a projection of power usage savings and be able to calculate power cost reductions. Savings over a time period (typically three to five years) should help justify the cost of the new power equipment.

ROI may not directly apply to adopting green. Even if vendors say that the ROI may be many years out, it's important to realize that when buying green, the benefits are not merely financial. Investing in a green product that significantly reduces your company's impact on the environment should be a reward in itself.

Still, vendors will quote ROIs, although it may be somewhat difficult to accurately assess the savings because the data center is usually a dynamic operation, with new servers replacing old servers and other frequent modifications to the center. "When we put in an AdaptivCool System, we gave up trying to figure out exactly how much energy you save. I talked to a data center guy who had equipment going in and out every week. How do you measure that? This guy said he was changing so many things he couldn't tell what the savings were," Birch says.

Depending on the technology used, some products can actually show real savings. For example, Surveyor, a product from

Verdiem, monitors servers and workstations and controls their power use. Systems that don't need to be on 24/7 can be turned off or set to hibernate. Screens that aren't being viewed can be turned off. Using Surveyor, actual benefits can be seen through monitoring power usage or when the power bill arrives.

Even if your IT department does not use a tool to automate power reduction strategies, there are many things that are being developed to reduce power use before monitoring and implementing other power-reduction measures. Power supplies in servers and workstations run more efficiently when they are used at near maximum load—a 500-watt power supply in a server that needs 200W will neither run as efficiently nor as coolly as an efficient 250W power supply installed



in the same server. Auditing the energy requirements of these devices can help you determine how big a power supply is actually needed. If you're relying on a vendor to make these determinations, check to see if the company has done this for other enterprises. If necessary, ask for references or for reports on actual cost savings that the customer received.

"The first thing you can do [when dealing with vendors] is to ask them to prove it. There's a lot of unproven emerging

technology that, while it may sound good, it may not bear the kind of fruit that IT managers are looking for," Verdiem's Heinz says. "I've seen a lot of green IT initiatives over the past years that didn't give results people were looking for."

Green Cooling & Computing Systems

Cooling is another area where green measures can reduce energy use. Designing server rooms and racks to efficiently move air is one approach that can provide immediate benefits. Designing so that the heat coming from the rear of computers doesn't mix with the cool air at the front of the racks can help reduce the amount of cooling required in a computer room. Intelligent air distribution using thermal monitors and appropriately positioned fans that move

cool air where it's needed can also help. Birch notes that enterprises are "clearly aiming at green. More people are looking at extending the life of computer rooms and saving money." More efficiently managing the cooling of data centers can help to reach both goals.

New servers designed to be green are also available from a number of manufacturers. These servers can help reduce the power usage while optimizing the thermal management of the systems. Look for computers that use multicore technologies. The CPUs in these systems are made using new processes that reduce the energy consumption of the CPU. Further, they produce less heat, so these systems will need less cooling, and less cooling

typically means less cost.

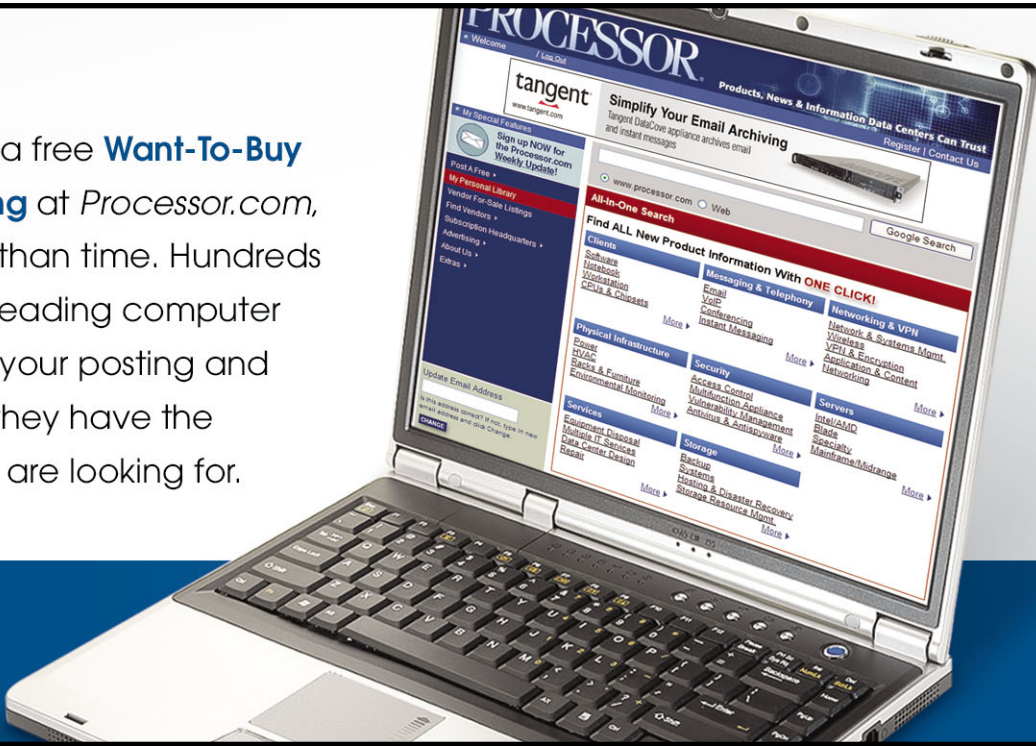
The manufacturers of these processors have formed a group that is aiming at reducing the carbon footprint of the manufacturing processes used to make their processors. So, in addition to reducing the amount of energy and cooling needed, the manufacturing process uses less energy and generates fewer emissions. When appropriate, moving to newer servers and other components based on these more efficient chips should also yield energy savings. [E]

ROI may not directly apply to adopting green. ROI may be many years out, but it's important to realize that when buying green, the benefits are not merely financial.

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Curbing IT Power Usage

Continued from Page 1

redundant power supply designs in today’s servers,” he says.

Approach Air Differently

“One of the things that wastes a lot of energy in the data center is the mismanagement of air,” says Michael Mallia, chief executive officer of AFCO Systems (www.afcosystems.com), a green data center solutions provider.

Many SMEs still use the hot aisle/cold aisle theory from IBM (www.ibm.com) in their data centers, which was developed in 1992, according to Mallia. The IBM approach was a way to begin to manage air distribution in the data center at a time when cooling wasn’t a major issue. “This approach wasn’t put together with an exponential growth in server densities in mind,” Mallia says.

Today’s servers, particularly blade centers, put a lot of heat in a very small space. To address that and keep cooling costs down, air distribution has to be just right so the room is not over-cooled or under-cooled, according to Mallia.

If the air distribution isn’t right, too much cool air can get back to the CRAC (computer room air conditioner). The cooling system will think there is too much cool air in the room and generate less air, leaving the room too hot, according to Mallia. “The server inlet temperatures need to be as even as possible across the room,” Mallia says. When they balance the temperatures throughout the room, SMEs save a lot of energy.

Spin Down The Storage Disk Drives

According to David Weiss, chief executive officer of Dataprobe (www.dataprobe.com), a disaster recovery and prevention technology innovator, one of the quickest returns on data center energy savings techniques comes from low-cost ways of getting the power turned off when not needed.

One of the best ideas around turning the power off is spinning down storage disk drives when they are not in use, according to Richard Solomon, host interactive architect at LSI (www.lsi.com), a leading storage technologies vendor and member of The Green Grid.

Data center storage drives run about 10,000 to 15,000rpm, whether they are in use or not. By turning off the motors that spin these drives, the data center can spin them down during idle times. “A disk drive motor is a big motor, so shutting down that motor saves a lot of energy,” Solomon says.

Solomon gives the following example: Take a typical 15,000rpm enterprise-class drive with an estimated operating mode power of 8 watts and an idle time power of 5.8W. Assume the drive electronics (with the rotational drive motor off) draw about 1W, on the generous side. That’s a drop from a 5.8W draw to a 1W draw by simply spinning down the drive. “That’s more than an 80% power reduction,” says Solomon.

SMEs need to work with their storage vendors to get firmware that will let them spin down these drives (if standby mode is not already available in the current drive configuration), according to Solomon. This will provide an immediate and substantial savings. If the drive has a standby mode that will power down the rotational motor, use it.

Shut Off Servers During Non-Peak Hours

Data centers in Japan are using UPS and software automation to safely shut down servers at certain times of the day, such as evenings and other non-peak hours. The software safely reboots the servers before peak hours return, according to Loeffler. These data centers keep only the most essential equipment running during off-peak times. By using this idea, an SME can save 30% to

Develop An Attraction For Heat Extraction

More and more, data centers are examining the benefits of heat extraction for their cooling systems rather than simply using bulk cooling, according to Chris Loeffler, product manager of the data center solutions group at Eaton (www.eaton.com).

SMEs accomplish heat extraction by isolating the cold and hot air returns from one another. They do that by ducting the hot air back into the air conditioner’s hot-air return, Loeffler explains. “This way, an SME doesn’t need specialized liquid cooling close to the racks; it’s done mechanically with the ducting itself,” he says.

The efficiency gain rises from being able to cool only about an 8kW load per rack to cooling a 20kW load per rack, according to Loeffler; that is an energy efficiency gain of about 25%.

40% off the power consumption it would normally see during non-peak hours, according to Loeffler.

End With Savings

Starting with good metrics, SMEs can pinpoint where the data center energy hogs are hiding. Then, they can develop a plan to manage them better or shut them down (if only some of the time). [E]

Quick Energy Saving Tips

Simon Mingay, research vice president at Gartner, gives a few key tips for fast ways to improve energy savings in your SME.

- Make sure raised-floor, plenum-area obstructions such as cabling are not blocking airflow to the vents.
- Make sure to get the chilled air where it needs to go and don’t vent hot air straight into other cabinets, servers, or equipment.

- Turn on the power-management features that came with your existing equipment.
- Make sure all equipment that is plugged in and drawing current is actually being used. “We are finding that most IT operations can reduce their power consumption by as much as 5 to 10% simply by identifying and removing equipment that is no longer in use or has very low utilization,” says Mingay.

One of the quickest returns on data center energy savings techniques comes from low-cost ways of getting the power turned off when not needed.



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Printing Green: It's A Win-Win

Is Your SME Pitching In To Help?

by Chris A. MacKinnon

EVERYONE IS THINKING GREEN these days, and the enterprise is no exception. There are many ways for small to midsized enterprises to contribute to a healthy environment. One of the biggest areas for improvement is printing. It should come as no surprise that enterprises waste thousands of sheets of paper and countless pounds of toner on a yearly basis. Jonathan Weiner, president of FinePrint Software (www.fineprint.com), says a study by Lawrence Berkeley National Laboratory showed that the typical office worker uses about 10,000 sheets (20 reams) of paper per year. The cost of the paper is about \$50, while the total printing costs are \$500.

Cutting Back

According to Hayden Hamilton, spokesperson for GreenPrint (www.printgreener.com), the typical SME can definitely cut down on paper and toner waste. He comments, "The easiest and least costly thing to do is to create a culture where you only print what really needs to be printed. The number of PowerPoint decks, agenda packs, and company handouts that are printed unnecessarily (and often go directly into the recycling bin or garbage) is astounding." Hamilton says one of the biggest benefits of GreenPrint is that it helps to change this behavior. GreenPrint's preview shows all the pages about to be printed on a screen simultaneously, before they go to the printer, which forces people to think about whether

they actually need everything about to be printed. Hamilton says people often realize just how much they actually waste.

Hamilton says the average Fortune 500 can save around \$2 million a year, 4,000 trees, and more than 12,000 tons of emissions from being produced, simply by using



GreenPrint in its facility. He says smaller-sized firms clearly will have the same advantage. In addition, Hamilton says GreenPrint changes the way people print and eliminates any unneeded pages, which saves the average user about \$90 (in ink, toner, and paper) and 1,700 pages a year (about one-fourth of a tree). He notes, "The environmental and financial savings are significant even on an individual level but for a midsized organization can be in the tens to hundreds of thousands of dollars a

year, depending on how much their employees print."

Do Your Part

So how can SMEs do their part to save paper and toner when printing? Hamilton says, for starters, look for the green team. He elaborates, "See whether your company has a green team set up to investigate environmental initiatives. The great thing about many solutions available these days is they are ROI positive pretty quickly, so they make financial sense, as well as being environmentally beneficial. This makes it a much easier sell to the management of SMEs who don't have a lot of leeway in their budgets."

Weiner says there are many ways to reduce paper consumption in an organization. He comments, "Two of the most common are duplex printing and multi-up printing. These methods can be effective but are not optimal. FinePrint supports duplex printing on all printers but emphasizes the multi-up printing method as the preferred mode."

Weiner says FinePrint has a number of other features that increase efficiency beyond multi-up printing. He notes, "Jobs can be previewed and printed on electronic versions of company letterhead and forms. This eliminates the need to purchase pre-printed forms and enforces company graphical standards. Multiple jobs can be batched together as a single print job, which eliminates the problem of having jobs interspersed with other jobs. Also, unwanted pages from email and Web pages can be deleted before printing."

Areas Of Improvement

Hamilton says many businesses will be surprised to know that they can impact the environment significantly and gain stronger ROIs using "green tech" products. He explains, "A pilot we ran just a few months ago with an office of 500 people saved 750,000 printed pages in one month, saving the average user in the office \$1,000 a year in ink, toner, paper, shipping costs, waste disposal costs, etc. and saving roughly 1,000 trees and reducing greenhouse gases by 7 million pounds."


Alongside printing as an area of improvement, Hamilton says power management is another big opportunity for

Printing Facts

Here are some interesting facts about printing, paper consumption, and paper growth as cited on the GreenPrint Web site (www.printgreener.com).

- The average cost of a wasted page is 6 cents.
- The average employee prints six wasted pages per day. That's 1,410 wasted pages per year.
- The average U.S. office worker prints 10,000 pages per year.
- In 2004, the United States used 8 million tons of office paper (3.2 billion reams). That's the equivalent of 178 million trees.
- The United States is the world's largest producer and consumer of paper. Per capita, U.S. paper consumption is more than six times greater than the world average.
- In the United States, enough office paper is used each year to build a 10-foot-high wall that's 6,815 miles long. That's more than the distance from New York to Tokyo.
- 40% of the world's industrial logging goes into making paper, and this is expected to reach 50% in the near future.
- Global paper products consumption has tripled during the past three decades and is expected to grow by half again before 2010.
- World demand for paper is growing faster than for other wood products. Worldwide paper consumption is predicted to double by 2020.

SMEs. He comments, "There are a number of new technologies on the market that give organizations the ability to dramatically reduce the amount of power consumed in the workplace. Many printers have power-saving modes that help the environment by saving energy (and reducing power bills)."

According to Hamilton, another avenue for improvement is fonts. He says, "Most fonts were created decades, if not hundreds of years ago, and thus without any thought towards conservation. We recently created a font called EverGreen aimed at maximizing the number of words on a page without compromising readability. This allows for significant paper savings (18 to 25%) vs. standard fonts (for example, Arial, Courier, Times New Roman) without any real downside." 

Consider Tiered Storage

Continued from Page 1

According to Scott Bush, director of marketing at AmeriVault (www.amerivault.com), a company specializing in managed data protection and offsite storage services, a tiered storage approach is worth considering. "If a company is lagging on its storage approach, it may want to reassess its storage approach in general, which would result in the implementation of tiered storage in the end," says Bush. "Tiered storage is a best practice for both primary and backup data, so it makes sense and saves cents to implement."

He notes, "In general, the benefits of tiered storage include cost savings, decreased backup times, and reduced resource requirements because archived files won't be backed up over and over again."

Perhaps the most obvious consideration before installing any sort of storage approach is the cost of implementation and the applicability of such an approach for an SME.

"Depending on your environment, you can also factor in the costs associated with each category," says Scott Delandy, senior product manager at EMC (www.emc.com). "You can now better understand the cost of information for each application and how to align the information infrastructure with the associated business requirements."

Implementation Factors

As Bush explains, data center managers should be aware of other issues surrounding a TSA (tiered storage architecture) implementation. "Implementing a TSA can be a daunting task even if the SME's storage environment is well maintained and relatively modern. Hardware and software interoperability are key concerns. Network configurations and limitations may create other hurdles. Remote sites and mobile employees will also need to be taken into account, and the steps involved in recovering archived data should always be considered."

Once managers consider the technical aspects of the install, the next step would be to meet with all business units to identify and classify data. Managers should set policies to determine what data should be migrated to the lower tiers of storage, and they should consider automating as much as possible.

Of course, implementing a tiered storage approach isn't as easy as it seems. As Bush explains, "For an SME, implementing a TSA can be very difficult. The time, labor, and investment may not justify an internal TSA. Calculating the total cost of ownership is key. Many in IT also report maintenance to be difficult and time-consuming for in-house solutions."

That said, a tiered storage approach may still be feasible for an SME. Not only does

it help companies focus on other strategies, such as growing the business, it helps them enjoy some peace of mind knowing all of their data is organized and accessible.

"Storing more effectively allows IT organizations to consolidate multiple application tiers into a single common infrastructure to optimize resources, lower costs, and improve service levels," says Delandy. "IT organizations can simplify storage management across the enterprise by leveraging automation tools and advanced capabilities, as well as improve energy efficiency by reducing the number of storage systems and networks."

Even better, online storage backup solutions have proven to be a lucrative asset to a company that doesn't want to employ the tape-based approach, which can add more complexity to an already complex design. In essence, online storage backup allows companies to put less-accessed information on more economical disks while maintaining regularly accessed data on more expensive (and more reliable) drives with the help of online automation.

An Option To Consider

As Bush explains, "Data growth is exploding, and data management incorporating policy-based tiered storage is an emerging best practice for SMEs. These companies need to get the most out of production storage and speed recovery times by not having to recover lower-value data with the critical [data]."

In a world where data management is increasingly becoming a paramount concern

Tiered Storage Options

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EMC Rainfinity Tiered Storage Management Application


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Hitachi Data Systems TagmaStore Universal Storage Platform & Network Storage Controller

Provide intelligent tiered storage by simplifying infrastructure and reducing costs throughout the enterprise storage network www.hds.com

HP ILM Tiered Storage

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for organizations, a tiered storage approach may help alleviate the pressure of worrying about data loss without sacrificing the kind of performance and reliability you would expect from your current installation. 

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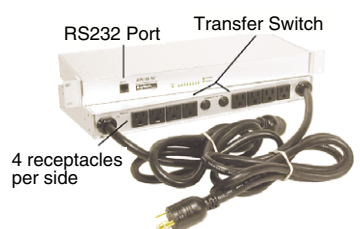


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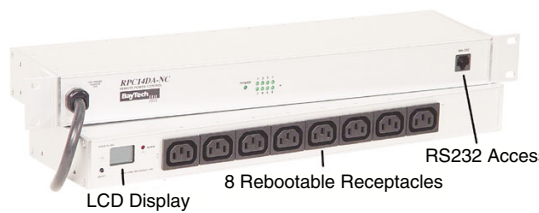


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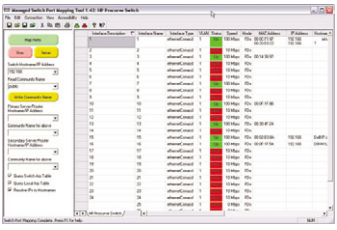
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Product Releases

CLIENTS

■ **Acrosser Technology** has announced the AR-B5230, EPIC SBC (single board computer) which includes an Intel 915GME chipset and support for Pentium M and Celeron M processors. This system is ideal for use with embedded systems, transportation, panel PCs, and digital signage. The AR-B5230 uses a standard form factor, supports future upgrades, and can be connected to by a PCI-104 expansion card. Because the system has multiple connectors on the edge of the board, less cable routing is necessary than with some similar systems. The AR-B5230 supports up to 1GB of DDR2-533, as well as VGA, LVDS, DVI, IDE, SATA, and a 12VDC single-voltage power supply. It also provides four high-speed USB ports, two 10/100-BaseT Ethernet ports, PCI-104, four COM ports, one 8-bit GPIO, and one PS/2 port.

■ **AMD** has announced the release of its HD 3000 Series of discrete video graphics for high-definition gaming and video in notebook PCs. Initial releases include the ATI Mobility Radeon HD 3400 series and Radeon HD 3600 series. AMD says the 3000 series is optimized for the company's upcoming "Puma" notebook platform. The series includes support for Microsoft DirectX 10.1 by enabling a higher level of realism through new lighting and rendering techniques. PCI Express 2.0 support enables faster throughput and system performance. The series will also support integrated DisplayPort connectivity and Blu-ray and HD DVD playback at a 1080p resolution (with an HD display) via ATI Avivo HD technology. AMD HD 3400 and 3600 series notebooks are now shipping

from Asus. HD 3000 series notebooks are expected in the first half of this year.

■ **BenQ** released the SP870 digital projector, which provides ultra-high brightness via a 5000 ANSI lumen lamp. This ultra-bright digital projector is targeted at businesses that want to use a projector without turning off the room's lighting. According to BenQ, the projector increases brightness and provides rich images with a DLP BrilliantColor chipset and UNISHAPE technology. BenQ also points to the projector's deep blacks and bright whites.

The SP870 weighs 10.8 pounds and measures 14.8 x 4.5 x 10.9 inches (WxHxD). It supports NTSC/PAL/SECAM video and includes D-sub, DVI-D component video, S-video, composite video, and PC audio inputs. The projector supports resolutions of 640 x 480 (VGA) and 1,280 x 1,024 (UXGA) and has a maximum throw distance of 10 meters. It provides vertical keystone adjustments of ±25 degrees and offers an image size up to 300 inches. Important features include HDTV compatibility, a presentation timer, wall color correction, and 3D color management tools.

■ **NextComputing** has announced a personalized mobile computing services program. The company says it is offering its line of OEM branding and customization options for quantities as low as 10 systems, with its personalized extreme mobile computing services program letting customers bundle their own software, components, and accessories with NextComputing's systems. Additionally, customers can add private labeling to the systems in configurations they choose. NextComputing will initially offer the business program to companies meeting criteria

in five vertical markets: Broadcast Media, Military/Intelligence, Medical Imaging, Test/Measurement, and Oil/Gas. Private labeling will be available initially on the NextDimension flextop family of systems. Further, customized products, configuration management, and documentation will be available in the Vigor line of ruggedized, portable high-performance systems and NextServer 4U rackmount servers.

NETWORKING & VPN

■ **Tidal Software** has announced the release of Tidal Enterprise Scheduler 5.3.1. The single job scheduler supports up-to-date applications and systems from Microsoft, Oracle, SAP, and VMware. According to Tidal Software, IT is now more enabled to function efficiently while gaining improved control over operations and resources. Job scheduling can become increasingly centralized, as well. The Tidal Enterprise Adapter for SAP Solutions 7.0 supports XBP 3.0, which allows the Tidal Scheduler to provide real-time business processing. The latest version of Tidal Transporter supplements Tidal Enterprise Scheduler and assists in managing data consolidation. Specifically, Tidal Enterprise Scheduler can operate with Oracle E-Business Suite 12, Microsoft Vista desktop, and Windows Vista/Server 2008.

PHYSICAL INFRASTRUCTURE

■ **ATEN** announced its 8- and 16-port IP KVM switches with built-in IP remote access. The KH1508i (designed for 8 ports) and KH1516i (designed for 16 ports) switches provide secure local and remote access to 128 and 256 servers, allowing IT administrators to monitor 16 different desk-

tops simultaneously. The KH1508i and KH1516i also contain PS/2, keyboard and mouse emulation, push-button, hotkey, OSD for port selection, as well as pass-



word-protected security and advanced encryption technology. KH1508i is available for \$849.95 while the KH1516i can be purchased for \$999.95.

■ **Belkin** announced the SOHO KVM switch family, which connects multiple computers to a single keyboard/mouse/monitor set. Each switch boasts a 2-port USB 2.0 hub (one of the ports is at the front, the other is at the back of the device) and touch-sensitive switching buttons. The switch provides independent audio switching and supports hotkeys.

Belkin will also offer several versions of the SOHO KVM switch next month. The 2-port VGA, USB, and PS2 (model F1DS102J) is available for \$159 and the 4-port version (F1DS104J) is available for \$189. The 2-port VGA and USB model (F1DS102L) is also available for \$159, and the 4-port version (F1DS104L) is available for \$189. Customers can also buy a 2-port DVI and USB model (F1DD102L) for \$219 and the 4-port version (F1DD104L) for \$269.

SECURITY

■ **Q1 Labs** has released the newest platform for monitoring network behavior and security management: QRadar 6.1. Matched with Q1 Labs' QRadar SLIM (Simple Log and Information Management), QRadar 6.1

NETWORKING & VPN



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Product Releases

offers upgraded searching capabilities within a network and increased protection of data. Other features include a user-friendly flow viewer for Network Behavior Analysis, enhanced Robust Log Management architecture, and expanded Security Event Management analysis capabilities. Vice President of Marketing and Product Management Tom Turner states, “QRadar was the first product to seamlessly combine NBA and SIEM functionality—something that many of our competitors are now attempting to achieve through technology partnerships or first-step technology integrations.” Standard pricing begins at \$39,000; current QRadar customers can upgrade for free.

STORAGE

■ **Acronis** has announced Acronis Recovery for MS SQL Server, a backup software system designed for large SQL databases. Acronis Recovery provides many of the benefits of Acronis True Image but is designed for more large-scale backups. The offering lets companies create backups and recover database information at the point of failure. Recovered data includes tables, logs, and other elements contained in the database. Acronis includes a wizard-style management console. Acronis Recovery for MS SQL Server is currently available at prices starting at \$499 per server, and Acronis plans to release Oracle and Exchange editions later in the first half of this year.

■ **Buffalo** announced the 500GB LinkStation EZ (LS-500GL) and 1TB LinkStation Pro Duo (LS-W1.0tGL/R1) as the newest members of its family of NAS devices. The LinkStation LZ allows users to store and

share files from multiple computers connected to the LAN via a 10/100/1000Mbps auto-sensing Ethernet port. The device is equipped with a 3.5-inch SATA hard drive and is easily adaptable to any network. The LinkStation Pro Duo is a high-capacity drive targeted toward a SOHO or SMB environment. Pro Duo is equipped with a 10/100/1000Mbps Ethernet port that can be used to connect to Buffalo’s Web Access feature that allows users to access files from anywhere with Web access. To get more memory out of the Pro Duo, Buffalo has also released the 320GB MiniStation TurboUSB that transfers data 60% faster than standard USB devices and is capable of storing media files or high-definition content. LinkStation EZ is available for \$199 while Pro Duo is priced at \$449. The MiniStation TurboUSB is available for \$229.

■ **DataCore Software** has unveiled a portable VM Starter SAN. This ready-to-use SANmelody bundle is iSCSI-enabled and provides auto-allocating storage support, enhanced data migration, and disaster recovery. DataCore’s portable SAN software can run on blade servers, hardware servers, or VMs. Because virtual storage from the Starter SAN can be served to multiple VM environments, pinnacle resource storage is available. The SAN offers virtual server protection through high-speed snapshots to accelerate disk backup. For remote site recovery, DataCore recommends utilizing two VM Starter packages for primary and secondary locations. Through DataCore’s Carry Forward Investment Protection Program, users can upgrade storage virtualization software and simply pay the cost difference. The SAN package is available for about \$4,000.



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MarketPlace NEWS

I 3Com Board Agrees To Merge
3Com's board of directors has given unanimous approval to a merger agreement between 3Com and affiliates of Bain Capital Partners. The acquisition should be completed during the first quarter of next year, pending approval by 3Com shareholders. The deal is worth about \$2.2 billion in cash, with shareholders receiving \$5.50 per share of common stock they hold. The figure represents a 44% premium over 3Com's \$3.84 closing price on Sept. 27. As part of the deal, Hsiao Technology of China will acquire a minority interest in the company.

I Congress Holds Hearing On Google/Oracle/Java Merger
LAWYERS FROM GOOGLE and Microsoft faced off at a Congressional hearing addressing Google's proposed acquisition of Oracle/Java. A display advertising company, Microsoft and other opponents argue that the merger would cut competition in online advertising, resulting in increased prices. According to Microsoft General Counsel Brad Smith, the merger would give Google control of 70% of the search-based advertising market and 50% of the online display advertising market. Google's Chief Legal Officer David Drummond, however, argues that Oracle/Java and Google have different business models, making Smith's estimates on the display advertising market a "wild-goose chase."

I Print Reports Quarterly Loss
Nokia's quarterly loss for the third quarter of 2007 was \$1.1 billion, or 11 cents per share. The company's revenue for the quarter was \$3.1 billion, or 31 cents per share. Nokia's revenue for the third quarter of 2006 was \$2.8 billion, or 28 cents per share. The company's revenue for the third quarter of 2005 was \$2.5 billion, or 25 cents per share.

Articles with valuable product overviews and data.

Virtual RAID Boosts Video Surveillance Storage
Pivot Enters The Market With An IP-based RAID Platform

Businesses considering video surveillance are looking at content or video management software and are looking for a way to protect their data. Pivot's RAID platform is a software-based RAID solution that allows users to protect their data by using a RAID configuration. The RAID configuration is a software-based RAID solution that allows users to protect their data by using a RAID configuration. The RAID configuration is a software-based RAID solution that allows users to protect their data by using a RAID configuration.

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Password Management Buying Advice

Choosing The Right System Can Be A Complex Process

by John Brandon

IDENTITY THEFT IS A SERIOUS CONCERN in IT: It compromises not only intellectual capital and personal security for employees but also reveals a security vulnerability that could lead to additional data theft—including company financials. When a hacker drives up to the curb of your business and loads a Linux-based tool onto his laptop to tap into a secure wireless network, one of the most common tools he uses is a password matching system. These powerful agents run a password guessing routine to bypass WPA and other encryption standards and serve as just one example of why password management is so critical for protecting servers, client PCs, networks, mobile devices, and other systems.

When IT does not manage passwords effectively, hackers can more easily find older passwords, find test string patterns, and compromise systems. When managed properly, passwords are harder to hack. Password managers help track password changes, enforce password policies, and govern the use of passwords through one integrated system.

One related and equally important aspect to managing passwords is in reducing help desk calls. Most IT experts know the most

common call has to do with losing a password. A password management system alleviates the stress of manually managing systems (some small businesses have relied on Microsoft Excel [www.microsoft.com] in the past) and helps an organization stay up-to-date on the myriad of passwords in use. In addition, the best password management systems provide self-service reset options to allow employees to skip the help desk call altogether.

“Automated password management solutions are designed to address the following pain points: high volumes of calls to the IT help desk to reset end-user passwords, relieve users from the burden of remembering multiple passwords for all of their business applications, [and] alleviate concerns about enforcing compliance with password security policies,” says Rachel Weeks from Courion (www.courion.com), which specializes in enterprise provisioning and access compliance. “Self-service solutions also allow the IT team to focus on important business initiatives as opposed to password resets, which are both time-consuming and monotonous.”

Of course, for IT managers, being convinced that a password management system makes sense and then actually choosing and installing one are different concepts. Often the process of shopping for a password

manager is much more difficult than convincing executives and decision makers of its importance.

Comprehensive Support

One of the differentiators for a top-tier password management system has to do with how comprehensive it is, even in a small to mid-sized enterprise where the number of systems may be fewer and the systems less complex than in a larger enterprise. The more systems a password manager supports, the better; having a good portion of enterprise applications and databases covered but manually managing a Web service or operating system makes password management only marginally helpful.

Courion’s Password Courier supports LDAP, SQL, OSes, applications, and other standards-based systems. According to Weeks, this wide support is what sets PasswordCourier apart from other options available. There’s multilevel support for many systems and support for key security features such as biometrics (such as fingerprint readers) and voice verification.

“As with any IT purchase, organizations should identify their key goals and objectives for implementing a password management system,” says Weeks. “Does the company need to decrease IT support costs by reducing calls to the help desk? Do users need self-service access to reset their passwords via desktop, phone, or Web access? Does the company require password synchronization

Password Management Tools

- Courion PasswordCourier**
Helps deploy self-service password requests and password synchronization across systems
www.courion.com
- Cyber-Ark Enterprise Password Vault**
Securely manage privileged passwords for Windows Server, Unix server, Cisco devices, and others
www.cyber-ark.com
- Quest Software SafeKeeping**
Secure system for the request, authorization, and change management of passwords
www.quest.com

across multiple applications or enterprise single-sign-on functionality?”


She continues, “Additionally, in order to improve user adoption, organizations should consider the convenience and flexibility of offering multiple access options, such as desktop; Web; telephone, such as touchtone keypad entry; and IVR (Interactive Voice Response) and voice verification, such as biometrics for authentication and speech recognition.”

Degree Of Management

For Quest Software (www.quest.com), the main buying advice for a password management system is to determine how many systems have been installed in the SME and the extent to which they need to be protected. In a small company, the infrastructure can grow rapidly, and keeping pace with that change often requires using a password management system.


“For any organization reaching a certain size in terms of its IT infrastructure, which

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C9659A	LaserJet 5500HDN\$2,795
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Ensuring Web Site Performance

Different Technologies Can Enhance The User Experience

by Timothy Warner

• • •

IN TODAY’S WEB 2.0 WORLD, organizations strive to make their Web sites more appealing to visitors. For instance, collaboration technologies such as Microsoft SharePoint (www.microsoft.com) allow for easy creation of dynamic, user-friendly intranet Web portals.

However, this high-tech usability comes with a potentially high cost. With Web development tools such as Ajax, SOA (Service-Oriented Architecture), and Adobe Flash (www.adobe.com) being used on virtually every corporate Internet or intranet Web site, how do SME data center managers ensure that user experience and Web application performance are optimized?

Redundant Network Links

Network link redundancy provides high availability for Web applications because the failure of the primary link involves immediate failover to the secondary link with little to no service interruption to users.

Elfiq Networks’ (www.elfiq.com) Vice President of Business Development Jean Pascal Hebert suggests data center managers leverage both backup network connections, as well as hardware-based load balancers, to maximize Web application availability and performance. He says, “For optimized Web site performance, multiple ISP connections from different providers using distinct

technologies would be the best strategy; the data center manager should also use a hardware-based Layer 2 link balancer in order to efficiently manage bandwidth.”

Hebert notes, “With this approach, bandwidth availability is ensured because in the event that your ISP becomes unavailable, your servers and services still remain available. Moreover, by using different connection technologies (DSL, cable, T1, fiber, etc.) from multiple service providers, data

Name Service) to respond to incoming requests for service by cycling two or more IP addresses that map to redundant Web front-end servers.

The presence of dedicated hardware and software logic makes hardware load balancing solutions more responsive and reliable than software-based solutions that are tied to a server operating system.

Barracuda Networks (888/268-4772; www.barracudanetworks.com) product manager Sean Heiney cites pure performance as the principal advantage of hardware-based server load balancing. “By using a hardware-based server load balancer, administra-

“By using a hardware-based server load balancer, administrators can stretch their hardware resources to an optimal extent.”

- Barracuda Networks’ Sean Heiney

center managers eliminate a significant single point of failure.”

Load Balancing

Generically speaking, load balancing refers to a hardware and/or software solution that spreads workload equitably between two or more computers or network connections in order to provide for low latency and therefore for maximum user response time.

One example of software-based load balancing technology is round-robin DNS, which works by configuring DNS (Domain

tors can stretch their hardware resources to an optimal extent,” he says. “Using load balancing features such as adaptive scheduling, the newest incoming service requests can be sent to servers with the lowest amount of active connections, CPU, or memory load, or even customer performance metrics as determined by the administrator.”

Web Accelerators

“Another way to minimize delay in Web services would be to configure Internet-facing DNS servers to answer queries but

modify the answer depending on where the user is located geographically,” says James Bryant, an IT consultant based in Nashville.

One company that is currently taking advantage of this type of distributed Web service architecture is Akamai (www.akamai.com). Bryant explains that “by placing their servers at major peering points within ISPs’ own racks, as well as using sophisticated algorithms, Akamai can offer a distributed Web server infrastructure that can feed Web data to hundreds of thousands of users by pointing them to the nearest and/or fastest copy of that requested data.”

Encryption is a processor-intensive service that is used to protect data and to ensure that the data has not been tampered in transit between the user’s computer and the Web server. A moderate load on a Web server using SSL or IPsec encryption can easily constrain the server’s CPU with the encryption/decryption requirement alone.

“To reduce CPU usage and consequently raise throughput, encryption and decryption of SSL and IPsec traffic can be offloaded to specialized network cards,” says Bryant. “These cards are purpose-built to perform the heavy lifting of data security just like a modern video card offloads computationally heavy graphics calculations.”

The Data Center Manager’s Role

So what role do data center managers play? Elfiq’s Hebert notes, “The IT manager has to work closely with his or her telecom team to ensure that servers are available and that bandwidth is not congested.”

Elfiq’s hardware-based load balancing products enable IT managers to provide both network uptime and link performance. The self-sufficiency of robust load balancing systems empower the data center manager to simply enable network traffic policies and alerting and let the load balancing hardware manage network traffic autonomously.

With these techniques, your users should have a snappier desktop experience interacting with your Web apps, and any downtime should be unnoticeable to all involved. P

Product Roundup

Product/Contact Info	Technology	Description
Akamai (www.akamai.com)	Hardware Web accelerator	Offers software, hardware, and outsourced solutions to optimize user access to Web sites and applications
Barracuda Networks Load Balancer (888/268-4772; www.barracudanetworks.com)	Hardware load balancer	Hardware appliance that combines IP load balancing with network intrusion prevention
Kemp Technologies LoadMaster (www.kemptechnologies.com)	Hardware load balancer	Offers Layer 7 content switching, persistent configuration options, and SSL (Secure Sockets Layer) acceleration to maximize server application performance
Microsoft Network Load Balancing (www.microsoft.com)	Software load balancer	A free, installable component of Windows Server 2003 that spreads network traffic loads equitably across two or more hosts, enhancing the scalability and availability of IP-based services
PipeBoost (www.pipeboost.com)	Software Web accelerator	Internet Server Application Programming Interface filter for Microsoft IIS 6.0 that uses HTTP/HTTPS compression to speed up Web site performance
Symphoniq TrueView Express (www.symphoniq.com)	Software user access monitoring tool	Aggregates detailed information on user transactions with Web applications and services

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PRODUCT OF THE WEEK

Rising To The Challenge

Cyber Switching Offers Feature-Rich PDUs That The Market Demands

by Brian Koerner

LET’S FACE IT: You cannot have a meaningful discussion with just anyone about the intricacies and features of a PDU (power distribution unit) without getting a few strange looks. A PDU, which distributes electric power by reducing high voltage and amperage to more useable and appropriate levels, is a device that many organizations reap the benefits of, but only a few truly understand. However, if you engage those responsible for managing IT infrastructure devices in data centers, production environments, and test labs, what is likely to ensue is an in-depth discussion about the growing demands to provide power to more and more mission-critical devices while having fewer outlets to do so. They would tell you that they need to manage the power to these

devices at a more granular level and that they need the ability to do it remotely.

Market Growth & Consumer Needs

The PDU market is strong, and if it reaches the expected compound annual growth rate of 12.5%, as predicted by a study from Frost and Sullivan, it will produce revenues in excess of \$460 million by 2012. The report, which states that the market was at \$209.2 million in 2005, indicates that the rackmount PDU market is likely to double that of the nonrackmount PDU market. In large part, this is due to the increase of data center applications used by IT infrastructure, telecom, finance, and banking. IT infrastructure contributed to at least 40.8% of rackmount PDU sales in 2005.

According to Gisa Abiog, director of marketing at Cyber Switching (408/436-9830; www.cyberswitching.com), during the past two years the company has seen a larger portion of the market migrating toward intelligent or remotely managed PDUs. Consumers are demanding more feature-rich PDUs with more granularity and accuracy in amperage readings and a plethora of other features, such as event logging, monitoring, security, and user management capabilities. And it doesn’t stop there—PDU consumers want to buy from a vendor that offers a product that can be customized to their needs, is easy to install, and is robust and very reliable.

Cyber Switching Products Set Themselves Above The Competition

As the market demanded more feature-rich PDUs, Cyber Switching, a California-based PDU manufacturer, rose to the challenge and set itself above the competition. Take, for example, Cyber Switching’s new DUALCOM s820, a feature-rich intelligent PDU with several interesting features.

According to Abiog, Cyber Breaker is a patent-pending feature that sets Cyber Switching products apart from its competitors. Greg Reynolds, vice president of engineering at Cyber Switching, explains that Cyber Breaker provides a virtual circuit breaker protection on an individual outlet basis, allowing for the protection of existing equipment by setting unused outlets to trip when a minimum current is drawn. This prevents someone from accidentally plugging in a device that would trip the branch circuit, potentially causing the whole rack to be lost.

If an overcurrent condition occurs on an outlet protected by Cyber Breaker, only the outlet whose current goes over the preset limit will “trip” the Virtual Circuit Breaker, and the whole rack will not go down.

Cyber Switching products are known for their remote management capabilities. The DUALCOM supports management through SNMP, the Web, and a serial interface. You can remotely reboot any outlet on the DUALCOM from across campus or around the world. There is also a separate EMC (Enterprise Management Console) to remotely manage multiple DUALCOM units. The EMC software tool provides a single, user-friendly, secure IP-based interface to auto-discover, manage, and monitor all Cyber Switching products connected to your network.

According to Murray Thibodeaux, founder of Murcom (www.murcom.com), an Internet

If an overcurrent condition occurs on an outlet protected by Cyber Breaker, only the outlet whose current goes over the preset limit will “trip” the Virtual Circuit Breaker, and the whole rack will not go down.

goes above or below limits that you set. The logging feature allows administrators to monitor who logs in to the unit, when outlets are switched, and when current thresholds are exceeded. And if security is your concern, Cyber Switching’s DUALCOM s820 provides the ability to control user accounts so that you can set different access and user per-

missions for each outlet to fit your specific needs. The interface is intuitive and provides the security and granularity needed in today’s complex environments.

To consumers such as Thibodeaux, an important but often overlooked feature is how easy it is to implement the product. The DUALCOM s820 provides an interface that is intuitive and user-friendly. The setup process is straightforward and typically takes less than five minutes. **P**



data center in Tulsa, Okla., the s820 DUALCOM unit saves his resources valuable time by providing his technicians the ability to perform tasks remotely and reducing the need to travel to remote locations.

The DUALCOM s820 from Cyber Switching provides an extensive level of monitoring capabilities all the way to the outlet level. You are able to monitor the current of each outlet in real time. You can monitor if the current at a particular outlet



PRODUCT OF THE WEEK

CYBER SWITCHING DUALCOM s820

Description: A horizontal intelligent PDU (power distribution unit) with remote power management capabilities that comes with Cyber Breaker, the Virtual Circuit Breaker, which allows you to set current limits on each outlet

Interesting fact: The DUALCOM s820 with Cyber Breaker, the Virtual Circuit Breaker, allows users to set the current limit with a time delay. Cyber Breaker protects against losing the whole rack by providing a software control to set a threshold on any outlet. If the threshold is exceeded, the outlet is virtually “tripped.”

(408) 436-9830
www.cyberswitching.com

DUALCOM s820 Technical Specifications

Output	
Output Voltage	120 VAC
Output Connections	(8) NEMA 5-20R
Maximum Output Current	16 A
Maximum Output Current Per Receptacle	16 A
Input	
Input Voltage	120 VAC
Input Frequency	60Hz
Input Cord Plug	NEMA 5-20P (other options available)
Input Connection Type	IEC 60320 C20
Regulator De-rated Input Current	16 A
Load Capacity	1920 VA

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More Than Just Hardware

Resellers Adding Services To Their Offerings

by Sandra Kay Miller

AS THE MARGIN FOR HARDWARE grows increasingly thin, resellers are turning to value-added services to supplement a quickly waning bottom line. Already staffed with technical professionals, it's only a short hop for resellers to offer a variety of services that can increase their customers' profits while creating a viable revenue stream for their own organizations.

Angela Vines, co-founder and vice president for ServiceKey (www.servicekeytss.com), a Georgia-based company providing technical services in conjunction with its channel partners for IT maintenance and backup, sees a variety of reasons for this trend. She says, "Manufacturers are building more durable and lasting solutions and are oftentimes selling directly to customers; software requirements are dictating less frequent equipment upgrades; and end users are taking advantage of manufacturer warranty services for ongoing maintenance, reducing or eliminating ongoing revenue for the reseller."

A New Twist

Although ServiceKey doesn't sell hardware, its model has been to partner with resellers lacking the ability to offer

comprehensive support services. Partnering with the reseller instead of providing services directly to the end users, ServiceKey delivers a seamless experience for the resellers' customers.

Even with OEM warranties, ServiceKey offers resellers a variety of avenues for increased sales, including service contracts and extended warranties.

With offices throughout North America, ServiceKey allows resellers to provide geographically diverse services for smaller resellers, thus giving it the opportunity to expand into territories it was previously unable to cover with support personnel.

Even more attractive, thanks to the cross-trained professionals at ServiceKey who are certified by major equipment manufacturers and software vendors, the blame-game during technical difficulties in a multi-vendor environment can be significantly reduced.

"The CIOs at the end-user level realize, 'Hey, we don't have to have all this expertise in-house. We can leverage our resellers and save money but without negating any service levels that we uphold,'" according to Vines.

New & Used

While offering services for new equipment is commonplace, resellers such as DMD Systems Recovery (877/777-0651; www.dmdsystems.com) and Information Technology Trading (877/715-3686;

www.itechtrading.com) offer services for used equipment.

One of the services offered is the purchase (or trade-in) of existing equipment when it comes time to upgrade technology. This provides an equitable opportunity for both involved parties: Resellers are able to maintain a steady supply of quality used equipment, and end users don't face a complete loss of the value left in their older equipment when it gets replaced with newer technology.

Recognizing that smaller organizations have the same technology disposal issues as larger enterprises, resellers are providing an assortment of IT asset retirement services.

As part of its Asset Management Services at DMD Systems Recovery, it provides EPA-compliant recycling and certificates of destruction. For organizations wanting to reallocate used assets, DMD can assist in determining where redeployed systems would best benefit.

Even when there's no life left in antiquated hardware, disposal services—especially green recycling—are becoming popular offerings from resellers. The European Union has already enacted legislation requiring resellers of all electrical equipment to offer recycling for the products being replaced.

"We believe that reuse is the highest form of recycling, and we have the processes and expertise to return nearly 80% of the retired electronics we receive to the marketplace," says Jeff Zeigler, TechTurn (www.techturn.com) founder and CEO. Instead of adding the growing mounds of replaced computer equipment to overflowing landfills, TechTurn refurbishes, repackages, and resells still-useful products and parts. "By approaching the market this way, TechTurn delivers both economic and environmentally friendly recycling solutions for computer

Services Resellers Offer

- Design and integration
- Equipment installation/removal
- Onsite maintenance
- Help desk support
- Backup and storage
- Asset management
- Architecture design
- Leasing and rentals
- Extended warranties
- Support for obsolete or proprietary equipment

manufacturers, corporations, or out-sourcers," Zeigler adds.

Good Sense

For small to medium-sized data centers and IT departments, outsourcing services to resellers can alleviate the need for additional staff and training when the company purchases new equipment.

In addition to selling both new and used IBM midrange, mainframe, and networking equipment, Information Technology Trading's professional services allow organizations' IT departments to focus on day-to-day operation instead of the complex process of design, integration, and maintenance.

Working in the opposite direction when old equipment must be supported, DMD provides support services for proprietary and obsolete equipment. Smaller organizations often use older systems due to budgetary constraints, but when employee turnover leaves no one with the knowledge

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PRODUCTS

AT WORK

What To Do With Aging PCs?

A Computer Leasing Firm Finds DMD Systems Recovery Has The Answer For Its Returned Equipment

by Kurt Marko

MANAGING THE ROLLOUT of new equipment is not any IT professional's idea of fun, but before bemoaning your problems disposing of old PCs and other hardware, imagine the predicament facing a company that turns over gear every month. Such a hardware treadmill could quickly turn into a warehouse full of obsolete, yet still functional, equipment. That's exactly the situation faced by one Arizona-based office equipment leasing company. Owner and CEO Mary Newstead found herself with a constant stream of equipment coming off lease that she knew had residual value but was of no use to her clientele of mainly Fortune 100 corporations. The company's problem turned out to be an opportunity tailor-made for DMD Systems Recovery (877/777-0651; www.dmdsystems.com), an asset recovery and IT services company specializing in liquidating old hardware.

Asset recovery, which involves the tail end of the hardware life cycle and incorporates everything from reselling to recycling, is increasingly popular with overstretched IT departments looking to offload the logistical and financial headaches associated with the normal PC replacement cycle. While most businesses only replace a fraction of their equipment every year, hardware-refresh headaches quickly become a migraine when you're in the leasing business and facing a steady stream of equipment returns as contracts mature.

Problem Background

Newstead founded her company with the goal of providing a total leasing solution for office and computer equipment—"anything from copiers to PCs to servers." Yet she says the company motto, "no deal is too small," means "we have a lot of small items from companies all over the world." Her large corporate clients want the latest technology, so lease returns are typically only three or four years old. "This is not throw-away equipment but not useful to my customers," she says. Thus, the company needed a way to recover the residual value of its investment. Compounding the challenge is the fact that many of her customers use leasing to outfit small field or sales offices and thus included "a lot of odds and ends" without large quantities of any one item.

Potential Solutions

Newstead initially tried to manage equipment disposition in-house by setting up a storefront on eBay that listed the most common items such as PCs. As anyone who has been on the selling end of an eBay auction can attest, this quickly became an administrative time sink. First, she needed a place to stage all the returning equipment prior to resale and ended up having to rent a small warehouse. She then discovered that managing the logistics—cataloging hardware, warehousing, reshipping, etc.—and running the eBay operation consumed substantial time from two employees, amounting to one full-time equivalent. In addition, she found that her eBay customers were far from the sophisticated IT pros she was used to dealing with on leasing deals and often expected a measure of post-sale support from her staff—something the company was ill equipped to deal with.

The final straw, and the issue that got the company out of the eBay business for good, was OS licensing. Newstead says that her corporate customers typically handle all software licensing internally, often through long-standing volume purchase agreements. Thus, her returning PCs didn't have any software licenses and were sold "bare." While this might be a blessing to Linux-loving geeks, her typical eBay customer was completely flummoxed by the prospect of having to buy and install the OS separately.

DMD To The Rescue

When Newstead decided it was time to outsource the entire process of equipment liquidation, she looked no further than her colleagues across town at DMD Systems Recovery. Newstead, a veteran of the Valley of the Sun's IT scene for more than 20 years, knew one of the principals at DMD, Morris Scott. That relationship, along with DMD's reputation, meant she never seriously considered another vendor.

DMD's asset recovery services are designed to handle precisely the situation faced by Newstead's company and ended up providing a turnkey solution for the problem. From Newstead's perspective, the process is quite simple. Her company provides DMD with a regularly updated list of equipment coming off lease and has its

customers ship the returns directly to DMD's facility in Phoenix. DMD inventories the hardware, validates its working condition, and resells it through a variety of channels ranging from other brokers and dealers to its online store. Newstead negotiates prices for the most common items in advance and says she feels DMD gives her fair value. Newstead says given that her



DMD Systems Recovery, Inc.

company knows exactly what equipment to expect back each month, she finds having negotiated pricing advantageous because it provides an accurate estimate of a lease's residual value.

In sum, DMD handles all the company's return equipment logistics and resale, sending a monthly check for the proceeds.

Benefits & Results

Using DMD to handle most of its equipment returns has allowed Newstead's company to focus on its core leasing business. No longer does Newstead have to dedicate someone to manage return logistics and eBay storefront administration—a significant savings in her small, three-employee company. The company also eliminated warehouse space formerly needed to stage returned equipment. Finally, her employees aren't saddled with support calls from befuddled buyers wondering why their PC didn't come loaded with Windows and other assorted software.

The savings and added efficiency provided by DMD's services could be critical as Newstead's company grows its business. Newstead notes that the current credit crunch precipitated by the subprime mortgage imbroglio may actually help her business. She has found that as companies find it more difficult to secure financing for capital purchases, leasing becomes a preferred (or perhaps, sole) option for acquiring new equipment.

Newstead says she is very happy with the services provided by DMD and has no plans to change what she sees as an ongoing relationship. She says, "DMD is great for the odds and ends that aren't big-dollar items." A potential growth opportunity for DMD might be in what Newstead terms "big dollar" equipment—things such as large, multifunction printers or plotters. Newstead says her company still handles these items internally because she has found she can get a greater return by selling this more costly and specialized equipment directly to brokers.

Newstead's company and DMD Systems Recovery have developed a nearly ideal symbiotic relationship, enabling Newstead to stay focused on providing the latest hardware to large corporations that find themselves in need of new equipment in a hurry and don't want to be bothered with a lengthy procurement cycle. Once the lease term ends, they want a hardware refresh with a minimal fuss, and while the back-end of the equipment life cycle is something the company had always struggled with, it is DMD's core competency. While most businesses don't have the hardware turnover of a leasing company, every IT department is faced with disposing of unneeded old equipment, and in this era of tight budgets and cost constraints, no one wants to leave residual value on the table. Asset recovery services such as DMD's eliminate the need for IT organizations to develop equipment resale expertise while ensuring they get fair value for used hardware.

DMD Systems Recovery

An asset recovery and IT services company specializing in new and refurbished computers, office equipment, and associated components; services also available for large organizations wishing to find a cost-effective and environmentally safe solution for disposing of computer and communications equipment

"DMD Systems is a company you can always trust to live up to its commitments; it's easy to work with and always honest," says Mary Newstead, owner and CEO of an Arizona-based office equipment leasing company.

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Rack, Console Manufacturers Offer Flexible, Custom Gear

Smaller Firms Gaining Ground In The Furniture Market

by Curt Harler

SERVERS AND COMPUTERS are the quarter-backs of the computer room. Everyone talks about them and watches their performance. They get all the attention. But when it comes to the heavy lifting—the linemen tasks—it is the racks and consoles that make it possible for the servers to do their jobs.

Several up-and-coming companies offer solutions along with tips for the small to midsized enterprise furnishing a data center. The key factors to keep in mind are to design a solution that meets today’s needs, can expand to fill tomorrow’s growth, and will be easy on the eyes.

Broadrack

“Before you get started, the most important thing is to be sure the solution you choose is scalable,” says Marty Hwang, U.S. sales manager for Broadrack (www.broadrack.com). “Be sure you can upgrade with ease.” Founded in 2001, Broadrack recently opened offices in California to serve its North American clientele.

Hwang points out that any data center equipment is expensive. “You don’t want to be replacing it in two years because you outgrew it,” he says.

That idea is a key part of the company’s Gemini series. The Gemini is a dual-rail console with modular KVM switch. The 15, 17, and 19 designations are the inches of display. “You can upgrade by replacing the KVM switch instead of replacing the entire console,” Hwang says. These consoles are on the higher end of the price spectrum because they have an LCD panel, so the modularity of the system is important.

The Gemini’s dual-rail design allows the user to leave the LCD flipped over, push back the keyboard drawer, and close the cabinet door. The drawer handle can be hidden, offering a flat cabinet surface when it is closed. For SMEs with cross-border or multinational locations, those keyboards can be customized in 17 languages for operations that require language fluency in the data center.

Broadrack also can customize the physical look of any of its equipment, either with company logos or custom colors. “We don’t produce a standard product or build for a standard market,” Hwang says. In fact, the company does a lot of OEM work. He does suggest making sure your systems are compatible with the various form factors and connectors from diverse manufacturers such as Sun Microsystems (www.sun.com), Apple (www.apple.com), and the PC clones.

Data Center Resources

“Our furniture is designed for the SME that wants quality furniture . . . something that shows their commitment to technology,” says Rick Berendes, principal and co-founder of Data Center Resources (www.datacenterresources.com). “We focus on server room solutions and helping people integrate cabinets with power.”

Any company that is installing new data center furnishings is probably going to have to live a long time with the decision it makes today. Berendes says there is no reason for an SME to settle for industrial-looking metal furniture. DCR’s offering is the Command Watch line. It offers nice laminates and decorative side panels and doors. The consoles are optimized for screens, whether two or three high or in a wide array across the desktop.

DCR is primarily a solutions provider. In addition to its own line of data center equipment, it also offers solutions from a broad spectrum of other providers. “We are a hybrid VAR and manufacturer,” Berendes says. The company sells a lot of Evans products, which are found in high-end network operation centers. “They cause sticker shock in some SMEs,” Berendes says.

The DCR line, he says, offers lower-cost furniture that combines quality and aesthetics. While the company will customize product, Berendes recommends SMEs be “a bit conservative” with color. Noting that

Best Time-Saving Product

Keeping track of what is in a data center is always a challenge. This year, Connectivity Technologies (www.contech1.com) expects to roll out its Genesys RFID solution for documenting and tracking all of the hardware, cabinets, and cable in the data center.

“This is an asset planning tool for everything from floor layout to asset changes,” says ConTech’s Tyler Miller. When released, it will allow an SME to do everything from budget for cable requirements to planning the rack and cabinet requirements to tracking any changes in the data center.

The software is based on the company’s present Obtain 24/7 offering, developed by Canadian software firm Knowledge Flow (www.obtain.com). It will mark where a cabinet is located, when it is moved, and where it gets relocated. Because it is RFID-based, it updates as soon as a rack or cable is moved.

ConTech also can do complete installation of data centers. “We do not subcontract,” says Miller. He says that in the 10 years it has been in business, it has never missed a contract-mandated cut-over date. “We pride ourselves on that,” he says.

some SMEs want furnishings in the corporate colors, he asks whether workers really
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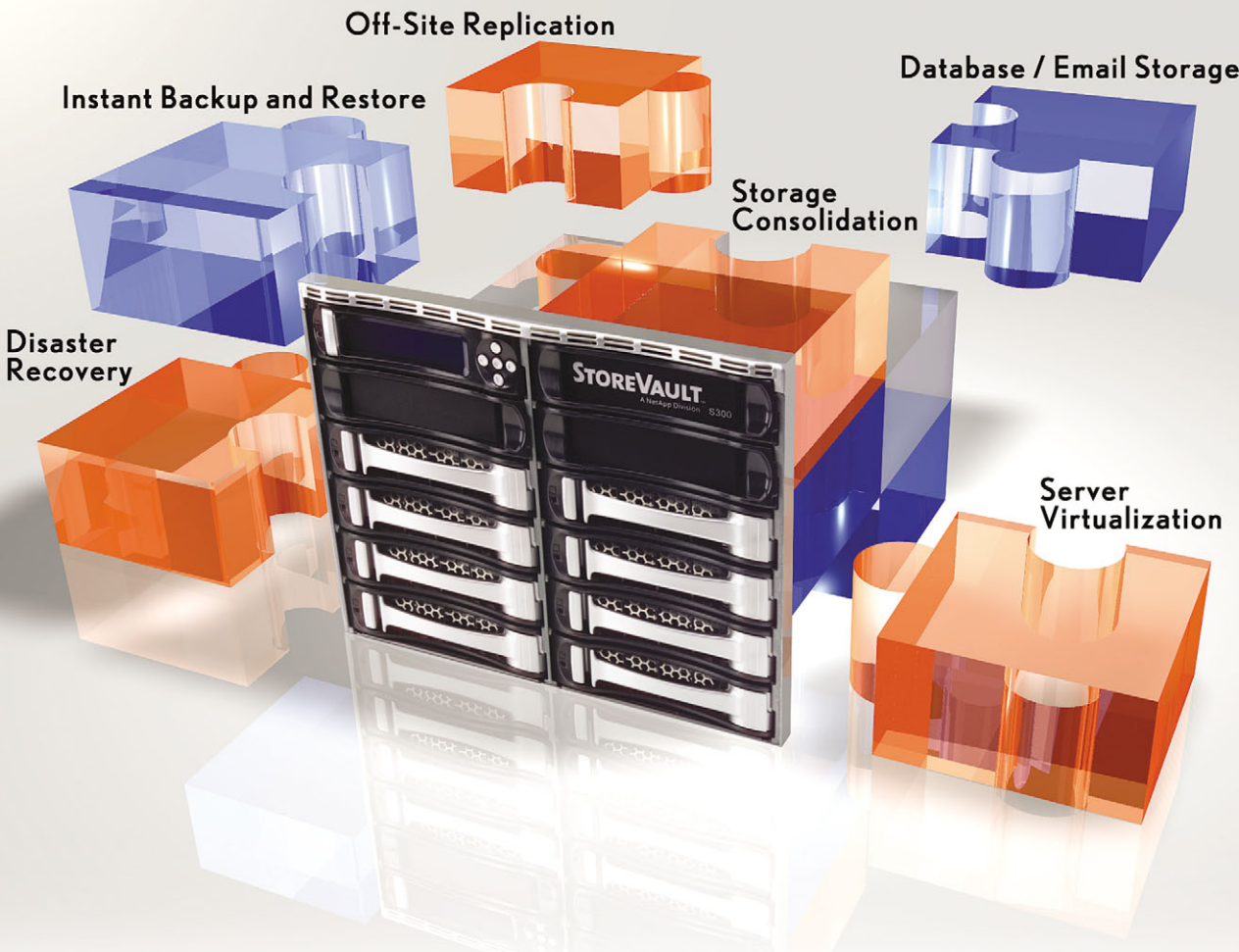


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Password Management Buying Advice

Continued from Page 16

typically means more than a few Unix/Linux hosts, a couple of routers, a database or two, and a few Windows systems, the management of privileged accounts or administrative passwords begins to present issues,” says Lora Deeds, a Quest spokesperson. “These accounts are used to obtain access to virtually every device, application, platform, and operating system, and the passwords associated with these privileged accounts grant access to programs and data.”

Extending The Defense

One of the key drivers for considering password management is to further protect

network systems. Cyber-Ark (www.cyber-ark.com) is a leader in understanding the needs of SMEs in terms of not just assisting the help desk (especially because a smaller organization doesn’t always have the support issues of a much larger enterprise) but in making passwords more secure. Many SMEs rely on a simple Access database to manage passwords, which obviously has no enforcement policies. Cyber-Ark Enterprise Password Vault forces every user to change his password at certain specified intervals, has full auditing features for compliance with industry regulations, and uses a Web interface that allows admins to see or change user passwords in about two clicks.

“As every IT manager knows, privileged passwords are the most powerful in any organization,” says Oded Valin, a Cyber-Ark sales engineer. “When an administrator logs in to a sensitive system, it is hard to track who actually used a shared identity. Managers should be able to see a real-time snapshot of administrative passwords and privileged account usage. The dashboard should include a group of different charts that graphically display your compliance with policies, usage status, and, of course, anomaly activities.”

In the end, password management should become an integral part of IT so that no password is entered unless it is tracked and

Buying Tips

Choose a password management system for multiple reasons—security, reducing help desk calls, enforcing policies, and easing admin burdens. Analyze all systems beforehand to determine the extent of your password management needs and choose a system that matches well with your environment. Even a smaller business with just a few routers and servers can benefit because growth occurs quickly, and managed systems can scale faster and easier.

logged and then managed for security. The idea is sound—and the tools available meet the needs of a growing SME. **P**

More Than Just Hardware

Continued from Page 19

of how to operate and maintain this equipment, companies are left scrambling to find someone who does, or they are faced with the unexpected cost of replacing or upgrading. By contracting with a reseller experienced with older or specialized hardware,

organizations can breathe easier knowing service is available. Although resellers have long included installation services as a natural complement to the hardware sales process, increasingly they are adding more technology life cycle services, such as management, maintenance,

security, backup, and storage, to further increase revenues. Basic professional services, such as installation and maintenance, have previously dominated the services market; however, Mike Baur, CEO of ScanSource (www.scansource.com), a point-of-sale reseller, sees a trend toward break-fix maintenance contracts and extended warranty programs. “I think every reseller out

there is looking at their business and trying to make money. We have a lot of resellers that are making money doing that [turning to services as a revenue stream] now,” he says. This shift provides an opportunity for resellers to differentiate themselves as being in a more credible position in the marketplace as opposed to those who don’t sell additional services. **P**

Rack, Console Manufacturers Offer Flexible, Custom Gear

Continued from Page 21

want to spend all day in a room that is purple and green. Hergo (212/634-4270; www.hergo.com) offers technical furniture for businesses of all sizes. The heart of its line includes open racking, enclosures, cabinet and relay racks, mobile hospital carts and PACS

(picture archiving and communication system) workstations, and flat-panel monitor arm assemblies. Its newest product is the Data Control Center line. “What sets us apart is that we are technology people,” says Kristen Speranza Diamond, vice president at Hergo. It started a sister company, Hertz Computer, in 1982, which was one of the first IBM PC clone manufacturers in the United States.

“Hergo offers top-of-the-line customer support,” Diamond says, adding that it prides itself on repeat business. “We know that despite how good a product may be, a customer will not return if the customer service is not there to back up the product. We provide immediate responses to online inquiries, as well as one-to-one account management throughout the sales consultation, quoting, and delivery processes,” she says.

A plus for the small to medium-sized enterprise looking to redesign a computer lab or office work space is Hergo’s one-stop shopping for space management needs. “In addition to open racking, we provide power, cable management, and rackmount LCD and KVM switching solutions so another vendor is not necessary to address these additional requirements,” Diamond says. **P**

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WHAT'S HAPPENING

Custom Server Options For A Cost-Conscious Market

ASA Computers Offers A Range Of Solutions Based On Various Platforms

by Julie Ritzer Ross

“CUSTOM CONFIGURATION is our niche. We build our products to spec to suit customers’ needs. If we were building houses, they’d be custom homes, not tract houses.” That’s how Arvind Bhargava, CEO of ASA Computers (408/654-2901; www.asaservers.com), describes the focus of his Santa Clara, Calif.,-based company, which since its inception in 1989 has been assisting individuals, companies, and organizations with their computing and networking requirements.

“Through various iterations of hardware and software flavors, we have been partnering with our clients in keeping their computing environment current in a cost-effective manner,” Bhargava says. Although the company was originally a “simple systems integration organization,” he notes, ASA Computers’ range of solutions and services has expanded significantly during the past few years. For example, its menu of full solutions includes ISP packages, servers for dot-com companies, and computing environments for schools and research organizations. RAID and NAS setups, network installation, and help desk support round out the roster.

Supports Open Architecture

Despite many changes in the field of computers, Bhargava observes, ASA Computers has maintained its belief in open architecture and multi-OS support. “This has allowed us

to offer a wide range of solutions based on various platforms, like Intel x86 and Alpha,” he notes. The open architecture permits the company to configure systems using industry-standard components that lead to an easy/cost-effective upgrade path and enable systems to be custom-configured based on clients’ specifications and requirements.

Following and keeping pace with developments in the BSD, Linux, Windows, and Solaris operating systems environments since the systems’ launches also helps in this regard, according to Bhargava. He adds that the company tests for system compatibilities with the help of various communities, as well as performing testing in its own labs.

Next Up: Cluster Server Solutions

ASA Computers has turned its attention to cluster server solutions and will introduce enhancements in this area this year. “For clusters, we are trying to standardize on cluster file systems like Luster, which has unique block-level features,” Bhargava notes. “We also continue to see a bigger and bigger need for a lot of nodes in a single application. It’s evident everywhere but is especially the case where university and other large research applications are concerned.”

He adds that ASA Computers’ work on the cluster service front will be done with consideration of the fact that cluster service offers enough availability for a majority of mission-critical applications, even though it

does not provide an ironclad guarantee of nonstop operation. In addition to multiple file systems and .BAN file systems, developments will help to maximize what the company sees as the key benefits of cluster service, specifically:

High availability. In a cluster service environment, disk drives, IP addresses, and other resources are transferred to a surviving server from a failed counterpart. In some instances, the failed application or system is restarted by the software on a surviving server. In other situations, the work is dispersed to the remaining nodes from the failed node. Either way, interruption in service is minimal.

Failback. When a failed server comes online again, the cluster service executes automatic rebalancing of the workload in a cluster.

Manageability. Using the cluster administrator feature, admins can manage a cluster as one system and manage applications as if they were running on a single server. Admins can move applications to different servers within a cluster and can move data to different servers in an identical manner. The cluster administrator also allows admins to manually balance server workloads and unload servers for planned maintenance, as well as monitor cluster, node, and resource status from any point on the network.

Scalability. Increasing demand is not an issue with cluster services, as they can be expanded to satisfy changing needs. Admins


may add additional nodes when the overall load of a cluster-aware application surpasses the capability of the cluster itself.

Custom Cluster Implementations

ASA Computers already has in place a number of custom cluster service implementations. One such implementation is at the University of Wisconsin at Milwaukee and comprises 640 nodes based on Opteron 175, 2GB memory, and 80GB SATA drives. Dubbed NEMO, the cluster is used for the detection of gravitational waves.

Storage Server Developments

ASA Computers also plans a number of introductions on the storage server front in the coming year, in tandem with what Bhargava deems “need for more resources there.” For example, he says the company is attempting to incorporate InfiniBand connectivity into its solutions.

The company has already rolled out several customizable storage servers during the past few months. For example, it now offers the NAS-1U-A, with 2TB of storage, at \$3,370.65. There are four upgrade options for the first CPU in the unit and five upgrade options for the second CPU, as well as at least three memory options (1GB, 2GB, and 4GB, plus others on request), two storage options (four 500GB 7,200rpm disks or four 750GB 7,200rpm disks), and two CD-ROM/floppy drive options. 

THREE QUESTIONS

For Pre-owned Network Gear, Try DNI

The Secondary Market Can Offer First-Rate Prices

by Daniel P. Dern

DATA NETWORKS INTERNATIONAL, aka DNI, a leading player in the networking secondary market, specializes in used, deinstalled, refurbished, and surplus pre-owned network equipment, ranging from routers and switches to access servers and other networking hardware. “I’ve been working in the used Cisco network business for 15 years,” says Paul Regolizio, president of DNI (973/486-0440; www.dni-llc.com). “I think I might have sold the first Cisco 7000 series blade.”

Most of DNI’s inventory, and requests for inventory, is from Cisco, but DNI also handles hardware from other manufacturers, including Extreme, Foundry, Lucent, Nortel, Redback, and Riverstone. During the past decade, DNI has provided service to enterprises, major

carriers, and service providers, as well as to resellers and IT consultants.

■ What are the biggest IT-related issues facing today’s small to midsized enterprises?

“Within my world, the challenges I see IT facing are keeping up with user needs for IT and network service, keeping up with all the technological changes, and keeping the network up-to-date while working with the budget you’ve got to work with,” says Regolizio.

The increased use of VoIP, video, and multimedia has significantly increased LAN and WAN bandwidth requirements, Regolizio points out, and other trends such as security,

compliance, and redundancy for high availability are also stretching IT budgets.

“Companies are looking to get more for their IT hardware dollars,” he notes. And while IT often wants to keep using existing gear, “availability of spare parts can be tight,” says Regolizio. “Vendors are often maintaining products for less time than companies want to keep running them. And IT often wants to stick with gear that staff is trained on, not start over.”

■ What should *Processor* readers know about your company’s products?

“Since Cisco really owns the network gear market—probably 85 to 90%, I’d guess—that’s what we focus on, in terms of products, product experts, and spare parts,” says Regolizio.

Data Networks International is always looking for new suppliers, especially of used Cisco gear, to buy from, Regolizio notes. “We have a large customer base already; I always have an outlet for used equipment. We always need new product since we’re not manufacturing it.”

For DNI customers, the prices for pre-owned gear can be compelling arguments, Regolizio notes. “We can provide equipment at 60 to 90% off the OEM list price. And the product we put out is 100% good as new; it works like one out of the box, and we provide warranties from 30 days to resellers and up to one year

for end users. We have Cisco-certified technicians who test the equipment and certify that it’s 100%. You can feel safe purchasing from us rather than somebody who is selling their stuff or selling equipment that’s broken, dented, etc. We make sure it’s all 100% cosmetic and in working condition before it leaves. So there’s no difference in functionality, just in price savings.”

Also, Regolizio points out, “We have availability in stock of equipment that may no longer be supported by Cisco or the other vendors. We can replace or enhance their current maintenance agreements by supplying them with hot onsite spares inexpensively, which a vendor may or may not maintain any longer. And for companies with multivendor environments, we provide one-stop shopping.”

■ What makes your company unique?

“Because our focus is on trying to buy from people, we’re happy with purchasing anything from a single low-end router or other \$1,000 item all the way through an entire multimillion[-dollar] network take-out, if someone’s replacing their entire network,” says Regolizio.

“When someone’s looking to sell their network gear, you can feel confident you’ll get a fair market value,” adds Regolizio. “We offer a free evaluation of the fair market value of their items, [so] we can tell you what it’s worth.”



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- Video tuning and skew adjustments available
- Dual version allows another KVM near computer



CrystalView™ Pro
Extends keyboard, video, mouse, audio and serial up to 33,000 ft

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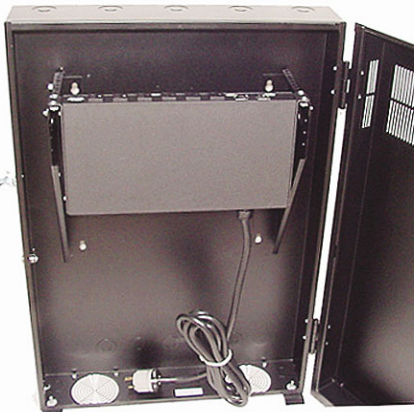
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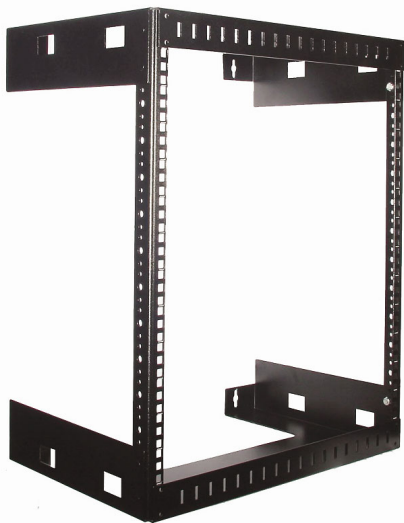
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